DOCUMENT RESUME

ED 101 864 PS 007 806

AUTHOR	Landrus, G. D.; And Others
TITLE	The Toronto Early Identification and Developmental Program. Report No. 130.
INSTITUTION	Toronto Board of Education (Ontario). Research Dept.
PUB DATE	Dec 74
NOTE	238p.
EDRS PRICE	MF-$0.76 HC-$12.05 PLUS POSTAGE
DESCRIPTORS	Academic Achievement; Bibliographies; Educational Research; Emotional Adjustment; Identification; *Kindergarten Children; Language Patterns; *Learning Difficulties; Models; *Primary Grades; *Program Descriptions; Psychological Services; *Screening Tests; Social Adjustment; Socioeconomic Influences; Standardized Tests; Tables (Data)

ABSTRACT

The Toronto Early Identification and Developmental Program (E.I.D.P.) has three main aspects: (1) the screening of kindergarten and first grade children in terms of potential learning difficulties; (2) service to the child and family together with supportive help to the school staff; and (3) research in connection with screening instruments. The introduction, in which the rationale and purpose of the program are discussed, is followed by the service manual which contains a model of the process of screening and service developed through the E.I.D.P. The practical information needed to implement an early identification program may be found in the manual. The two-part research section is composed of reports of studies involving various groups of schools. The Forest Hill report provides a description of the screening process which preceded the main E.I.D.P. The central portion of the research report is a description of the predictive tests and interviews used in selecting high risk children and includes a discussion of the major screening packages in terms of reliability and validity. The bibliography contains a list of tests as well as reference sources. Appendixes include instructions for administering and scoring screening tests and samples of interview forms and letters. (SDH)

ISSN 0316-8786

ED101864

U S DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

The Toronto Early Identification and Developmental Program

BEST COPY AVAILABLE

by G. D. Landrus, M.Sc.; A. E. Brown, M.A., Ed.D.; E.R. Long, Ph.D.

Prepared by: Department of Psychological Services,
Toronto Board of Education.

Distributed by: The Research Department,
Toronto Board of Education, December, 1974.

Report #130.

PS007806

Acknowledgements

The Trustees of the Board of Education for the City of Toronto provided the mandate and resources for the Toronto Early Identification and Developmental Program. Their foresight in initiating a program of the scope of the E.I.D.P. is most commendable.

The students, teachers and principals who participated in the work of this program have made major contributions. We have learned a great deal from the children involved in the project. Without the cooperation of scores of educators the program would have been impossible to establish or maintain. The suggestions which have been offered by teachers and principals have been instrumental in contributing to the growth and refinement of the Early Identification and Developmental Program.

The late Eleanor Long provided the leadership which maintained the E.I.D.P. during the initial years of the project. She served as Senior Psychologist for the E.I.D.P. staff unit within Psychological Services. Her work on the Forest Hill project provided a guide and model for the larger E.I.D.P. service.

The staff members of the E.I.D.P. constituted the day-to-day reality of the program. The project was developed through their work. Through their intelligence, initiative, and diligence they made the program a success and have been instrumental in implementing the E.I.D.P. in a larger context. The report presented here is but an outline and summary of the myriad tasks they performed. In essence, the Toronto Early Identification and Developmental Program is the creation of the people who constituted the E.I.D.P. staff:

Susan Benson
Ed. Biggs
Isabel Cargill
Carolyn Davis
Julia Holt
Shirley Jennings
Marta Klavins
Gary Landrus
Eleanor Long
Jane MacEwen
Kyle Manning
Dorothy McKenzie
Kiyoko Miyanishi
Inez Newbold
Marj. Perkins
Donna Reimer
Jean Ricketts
Thaia Roberts
Dale Smith
Farhana Subhani

The Service Manual section of this report is largely the result of the joint efforts of the authors and several of the former E.I.D.P. staff members including: Isabel Cargill, Julia Holt, Marta Klavins, Kyle Manning, Dorothy McKenzie, Inez Newbold and Marj. Perkins.

Thaia Roberts is primarily responsible for developing the Perceptual Forms Scoring Guide.

Invaluable work in the often tedious tasks of test scoring, data compilation and typing previous drafts of the report and sundry other secretarial duties have been performed by: June Budgell, Eileen Comba, Mary Diana, Carol Garland, Elizabeth Gohn, Lillian Harris, Aimée Millin, Eleanor Rea and Bernice Robertson. Without their efforts the research phase of E.I.D.P. and a considerable amount of the service phase of E.I.D.P. would simply not have been possible.

A special note of appreciation is due Shirley Swan who typed the manuscript of this report and made many suggestions and improvements.

Marj. Perkins and Susan Eadie collaborated on previous drafts of the report and furnished many valuable suggestions. Their interest and contributions are very much appreciated.

In spite of the involvement and assistance of these persons, this report undoubtedly contains errors and oversights. Errors of commission or omission are the responsibility of the senior author.

G.D.L.

A.E.B.

December, 1974

CONTENTS

Page

1. Introduction 1

2. Service Manual 6
    - Phases of Process of E.I.D.P. 14
        - Preparation Phase 14
        - Level I 15
        - Level II 18
        - Level III 20
        - Referral 22
        - Conclusion 23

3. Research Report 25
    - Socioeconomic and Language Factors 25
    - Forest Hill Report 30
        - Method 31
        - Comparison of Selected and Non-Selected Groups 35
        - Academic Achievement 40
        - Grade Placement 50
        - Referrals to Psychological Services 50
    - Statistical Procedures 60

Page

Predictors 64

Teacher-Psychologist Interview 64

D.A.P. I.Q. 65

Perceptual Forms 69

Kirk XO Test 75

Criteria 104

Level of Instruction in Reading 104

Gates-MacGinitie Reading Tests 110

Comparison of Screening Packages 122

Reliability 122

Correlations with Criteria 127

Performance of Selected Children 146

Efficiency and Effectiveness 156

Costs and Benefits 161

Summary 164

4. Bibliography 166

Reference Sources 166

Tests 170

Page

5. Appendix 174

A. Drafts of Letters to Parents to be Considered by Principal 174

B. Instructions for Administering Perceptual Forms Test and Draw-A-Person. 180

Scoring Guide for Perceptual Forms 182

Criterion Score Tables for Perceptual Forms and Draw-A-Person 194

C. Pupil Description Scale 200

Teacher-Psychologist Interview 201

Teacher Screening Form 202

D. Post-Screening Letters to Principal 203

E. Teacher's Rating Chart (A) 213

Teacher's Rating Chart (B) 214

Teacher's Rating Chart Reliability (B) 215

F. Forest Hill Health Form 217

List of Tables

Number		Page
1.	Number of pupils identified by Teacher's Screening Device.	33
2.	Forced diagnosis: Presence of perceptual inefficiency revealed in psychological assessment at Kindergarten level.	41
3.	*Teacher's Rating Chart*, Means and t: for the Selected and Non-selected Groups.	43
4.	Mean reading achievement, *Gates-MacGinitie Reading Test*.	44
5.	*Teacher's Rating Chart*, Mean instructional level in reading.	48
6.	Mean reading achievement, *Gates-MacGinitie Reading Test*.	49
7.	Grade placement in fifth year after Kindergarten.	51
8.	Nature of difficulties revealed in assessment of pupils referred to psychological services.	53
9.	Severity of learning disability in terms of help received for children with perceptual difficulty.	54
10.	*XO* Grade One N, Mean, Standard Deviation	82

Number Page

11. XO Kindergarten, N, Mean, Standard Deviation 86

12. End of Grade One Level of Instruction in Reading for groups selected by various XO Quantity Scale criterion scores and for groups unselected by the XO Quantity Scale criterion scores. 87

13. End of Grade One Level of Instruction in Reading for groups selected by various XO Quality Scale criterion scores and for groups unselected by the XO Quality Scale. 88

14. Grade placement four years after XO administration in Grade I. 90

15. Grade placement four years after XO administration in Kindergarten. 91

16. Students referred to psychological services in four years following administration of XO in Grade I. 93

17. Students referred to psychological services in four years following administration of XO in Kindergarten. 94

18. Later grade placement of children with bizarre and non-bizarre scores on XO Tests administered in Kindergarten or in Grade I. 96

Number Page

19. Means for Low, Mid, High and Bizarre Grade One XO groups in terms of Level of Instruction in Reading at the end of Grades One, Two, and Three. t tests for Low-Mid and Mid-High. 98

20. Means for Low, Mid, High and Bizarre Kindergarten XO groups in terms of Level of Instruction in Reading at the end of Grades One and Two. t tests for Low-Mid and Mid-High. 99

21. Means for Low, Mid and High Grade One XO groups on individually administered tests. 100

22. t tests for Low, Mid and High Grade One XO groups in terms of individually administered tests. 101

23. Means for Low, Mid and High Kindergarten XO groups on individually administered tests. 102

24. t tests for Low, Mid and High Kindergarten XO groups in terms of individually administered tests. 103

25. Discrepancies between Level of Instruction in Reading ratings and Gates-MacGinitie Reading Test Grade Scores. 121

26. XO Grade One administration - socioeconomic and linguistic characteristics of schools involved in Gates-MacGinitie Reading Test administration. 128

Number Page

27. *XO* Kindergarten administration - socioeconomic and linguistic characteristics of schools involved in *Gates-MacGinitie Reading Test* administration. 129

28. Correlation coefficients of *XO* administered in Grade One and *Level of Instruction in Reading* at end of Grades One, Two and Three. 131

29. Correlation coefficients of *XO* administered in Grade One and *Gates-MacGinitie* Vocabulary and Comprehension Scores at end of Grades One, Two and Three. 132

30. Correlation coefficients of *XO* administered in Kindergarten and *Level of Instruction in Reading* at end of Grades One and Two. 133

31. Correlation coefficients of *XO* administered in Kindergarten and *Gates-MacGinitie* Vocabulary and Comprehension Scores at end of Grades One and Two. 134

32. Correlation coefficients of *XO* administered in Kindergarten and Grade One and *Level of Instruction in Reading* at end of Grades One and Two in four schools. 136

Number Page

33. Correlation coefficients of XQ administered in Kindergarten and Grade One and Gates-MacGinitie Vocabulary and Comprehension Scores at the end of Grade One in four schools and Grade Two in two schools. 137-138

34. Correlations for Teacher-Psychologist Interview, XQ, D.A.P., and Perceptual Forms administered in Fall of Grade One and Level of Instruction in Reading for end of Grade One and end of Grade Two. 140

35. Multiple correlations for Teacher-Psychologist Interview, XQ, D.A.P., and Perceptual Forms administered in the Fall of Grade One and Level of Instruction in Reading for end of Grade One and end of Grade Two. 142

36. Correlations for XQ, D.A.P., and Perceptual Forms administered in the Spring of Kindergarten, and Level of Instruction in Reading for end of Grade One. 144

37. Multiple correlations of XQ, D.A.P., and Perceptual Forms administered in Spring of Kindergarten, and Level of Instruction in Reading for end of Grade One. 145

38. Comparison of Selected and Unselected students based on Fall Grade One screening in terms of Level of Instruction in Reading at the end of Grades One, Two and Three, and Gates-MacGinitie Vocabulary and Comprehension Scores at end of Grade One. 147

Number Page

39. Comparison of Selected students and all students screened based on Spring Kindergarten screening in terms of Level of Instruction in Reading at the end of Grades One and Two, and Gates MacGinitie Vocabulary and Comprehension Scores at end of Grade One. 148

40. Comparison of the XO Test and the Teacher-Psychologist Interview components of Grade One screening battery in terms of Level of Instruction in Reading at end of Grades One and Two, and Gates-MacGinitie Vocabulary and Comprehension Scores at end of Grade One. 150

41. Comparison of Selected students and all students screened by XO and T.P.I. in Grade One in terms of Level of Instruction in Reading at end of Grades One and Two, and Gates-MacGinitie Vocabulary and Comprehension Scores at end of Grades One and Two. 151

42. Socioeconomic and linguistic characteristics of eighteen matched schools. 153

Number Page

43. Comparison of Teacher-Psychologist Interview and IQ Kindergarten screening package and Teacher-Psychologist Interview and Draw-A-Person and Perceptual Forms Kindergarten screening package in terms of Level of Instruction in Reading at end of Grade One. 154

44. Comparison of Selected students and all students screened in Kindergarten in terms of Level of Instruction in Reading at the end of Grade One for all schools in the sample, inner-city schools and non-inner-city schools. 155

45. Comparison on T.P.I. - D.A.P. - Perceptual Forms Grade One screening package and T.P.I. - IQ Grade One screening package in terms of efficiency and effectiveness as indicated by percentage of children at various Levels of Instruction in Reading at end of Grade One. 159

46. Comparison of D.A.P. - Perceptual Forms Kindergarten screening tests and IQ Kindergarten Tests in terms of efficiency and effectiveness as indicated by percentage of children at various Levels of Instruction in Reading at end of Grade One. 160

Number		Page
47.	Criterion scores of Grade One D.A.P. for six Toronto areas.	195
48.	Criterion scores of Grade One Perceptual Forms for six Toronto areas.	196
49.	Criterion scores of Kindergarten D.A.P. for six Toronto areas.	197
50.	Criterion scores of Kindergarten Perceptual Forms for six Toronto areas.	198
51.	Test-retest Reliability of Teacher's Rating Chart (B) Items.	215

List of Figures

Number		Page
1.	Successive sieves model of screening employed in the Early Identification and Developmental Program.	8
2.	Phases in the Early Identification and Developmental Program process.	13
3.	Socioeconomic and linguistic characteristics of Toronto school populations. For each school the percentage of heads of households in the lower socioeconomic group and the percentage of students not learning English as their first language are shown.	27
4.	Frequency distribution of the number of items on the Teacher-Psychologist Interview in which students are mentioned. The Teacher-Psychologist Interview was administered in the Fall in Grade One, N = 4107.	66
5.	Frequency distribution of the number of items on the Teacher-Psychologist Interview in which students are mentioned. The Teacher-Psychologist Interview was administered in the Spring in Kindergarten, N = 947.	67
6.	Frequency distribution of D.A.P. I.Q. Scores. The D.A.P. was administered in the Fall in Grade One, N = 4247.	70

Number		Page
7.	Frequency distribution of D.A.P. I.Q. Scores. The D.A.P. was administered in the Spring in Kindergarten, N = 2864.	71
8.	Frequency distribution of Perceptual Forms Total Scores. The Perceptual Forms was administered in the Fall in Grade One, N = 4770.	73
9.	Frequency distribution of Perceptual Forms Total Scores. The Perceptual Forms was administered in the Spring in Kindergarten, N = 1868.	74
10.	Frequency distribution of XO Quantity Scores. The XO was administered in the Fall in Grade One, N=3881. Kirk administration and scoring standards were used.	78
11.	Frequency distribution of XO Quality Scores. The XO was administered in the Fall in Grade One, N = 3881. Kirk administration and scoring standards were used.	79
12.	Frequency distribution of XO Quantity Score means and lowest 5 per cent criterion score in each of 38 schools. The XO was administered in the Fall in Grade One, N = 38 schools. Kirk administration and scoring standards were used.	80

Number Page

13. Frequency distribution of XO Quality Score means and lowest 5 per cent criterion score in each of 38 schools. The XO was administered in the Fall in Grade One, N = 38 schools. Kirk administration and scoring standards were used. 81

14. Frequency distribution of XO Quantity Scores. The XO was administered in the Spring in Kindergarten, N = 2160. E.I.D.P. administration and scoring standards were used. 84

15. Frequency distribution of XO Quality Scores. The XO was administered in the Spring in Kindergarten, N = 2160. E.I.D.P. administration and scoring standards were used. 85

16. Frequency distribution of Level of Instruction in Reading: Grade One. The rating of the Level of Instruction in Reading was obtained in the last month of Grade One, N = 17,883. 106

17. Frequency distribution of Level of Instruction in Reading: Grade Two. The rating of the Level of Instruction in Reading was obtained in the last month of Grade Two, N = 7847. 108

Number Page

18. Frequency distribution of Level of Instruction in Reading: Grade Three. The rating of the Level of Instruction in Reading was obtained in the last month of Grade Three, N - 2689. 109

19. Frequency distribution of Gates-MacGinitie Reading Test Vocabulary Grade Scores: Grade One. The Gates-MacGinitie Reading Test was administered in the last six weeks of Grade One, N = 2063. 112

20. Frequency distribution of Gates-MacGinitie Reading Test Comprehension Grade Scores: Grade One. The Gates-MacGinitie Reading Test was administered in the last six weeks of Grade One, N = 2089. 113

21. Frequency distribution of Gates-MacGinitie Reading Test Vocabulary Grade Scores: Grade Two. The Gates-MacGinitie Reading Test was administered in the last six weeks of Grade Two, N = 1634. 115

22. Frequency distribution of Gates-MacGinitie Reading Test Comprehension Grade Scores: Grade Two. The Gates-MacGinitie Reading Test was administered in the last six weeks of Grade Two, N = 1630. 116

Number Page

23. Frequency distribution of *Gates-MacGinitie Reading Test* Vocabulary Grade Scores: Grade Three. The *Gates-MacGinitie Reading Test* was administered in the last six weeks of Grade Three, N = 255. 117

24. Frequency distribution of *Gates-MacGinitie Reading Test* Comprehension Grade Scores: Grade Three. The *Gates MacGinitie Reading Test* was administered in the last six weeks of Grade Three, N = 256. 118

INTRODUCTION

Prior to the implementation of the Early Identification and Developmental Program, the psychological service of the Toronto Board of Education had relied, almost exclusively, on teacher referral for initial identification of children experiencing serious difficulties in school learning. It has become increasingly apparent, however, that such a procedure was not, in itself, adequate to enable a large proportion of such children to receive help early enough to be of maximum benefit. The reasons for this were many and included such factors as teacher turnover, student mobility, and the difficulties untrained personnel have in identifying such children. Other complicating factors included the high ratio of students to psychological services' personnel. With a relatively small amount of psychologist time available to them, it was only natural for teachers to tend to refer those children who were the most troublesome to them. These were not always the children in greatest need.

If the child is eight or nine years old before his difficulty is identified and help is offered to him, the likelihood is increased that he will develop a self-image of failure, become frustrated at his inability to learn, and develop an overlay of emotional reactions that in turn make even more difficult the possibility of successful achievement.

The early identification of children who are likely to have difficulties in learning enables the school to make appropriate adjustments in the school program. Gearing the program to the child's developmental stage and providing enriching experiences to compensate for possible lacks in his background should help him to make better use of his educational setting. The teacher's understanding of the children and their varying and individual needs is enhanced. The process also makes it possible to institute specialized remediation at a relatively early stage when remediation is more apt to be effective.

When classes for the "perceptually handicapped" began to be set up it became evident that many learning disable children were not referred until they were eight, nine, or even ten years of age. Consequently, the Board authorized an increase in the psychological service staff to make possible the detection of a higher proportion of educationally "high risk" children early in their school careers. It was decided, in other words, to institute a screening or case-finding procedure in kindergarten and grade one to supplement the regular practice of teacher referral.

It was evident from the literature and from experience that no one instrument was adequate for such a task, nor had any satisfactory procedure been demonstrated. It was therefore necessary to conduct a research project to produce such a procedure. However, because of the urgency of the problem, it was impossible to postpone efforts at early identification and amelioration until the research had been completed. Consequently, it was decided to mount a mixed research-service endeavour.

The research aspect of the E.I.D.P. was conceived as an attempt to investigate a variety of techniques and instruments to determine the most adequate procedure for the early identification of children "at risk" educationally. The service aspect of the program involved the identification of high risk children as adequately as possible at any given stage of the research and the provision of follow-up services for them.

The program has had three main aspects:

(1) the screening of kindergarten and first-grade children in terms of potential learning difficulties;

(2) service to the child and family together with supportive help to the school staff; and

(3) research in connection with screening instruments.

Every junior school in Toronto has at some time participated in the E.I.D.P. Over 25,000 children have passed through the process of E.I.D.P. screening. Several thousand children have received special assistance much earlier in their school careers than would have otherwise been possible. In many cases this assistance has been preventative rather than remedial.

The E.I.D.P. Report is composed of five sections. This Introduction is followed by the Service Manual in which is presented a model of the process of screening and service developed through the E.I.D.P. The phases of the E.I.D.P. are discussed in detail in the Manual. The practical information needed to implement an early identification program may be found in the Manual. This information is presented in a step by step format and may form the framework from which an effective program may be developed.

The Research Report is composed of reports of several studies involving various groups of schools. The schools are described in terms of socioeconomic and linguistic characteristics of the school populations. By the description of these characteristics the reader may be able to judge the extent to which results obtained from a particular sample of schools may be generalized to another sample of schools.

The Forest Hill Report section of the Research Report provides a description of the screening process which preceded the main E.I.D.P. This study involved a relatively small sample of schools and it was therefore possible to provide much more detailed information than was possible for later samples.

The central portion of the Research Report is composed of a description of the predictive tests and interviews used in selecting high risk children. One of the tests described was developed largely through the E.I.D.P. The criteria which were used to measure the success of the selection are also described. A discussion of the major screening packages in terms of reliability and validity concludes the Research Report.

The Bibliography is composed of two sections: a list of reference sources and a list of tests. The titles listed should be viewed only as a minimal accounting of material which is available.

The Appendix contains instructions for administering and scoring screening tests. Samples of various interview forms and letters used in the E.I.D.P. are also provided. The Appendix should be referred to in conjunction with the Manual.

SERVICE MANUAL

This manual presents a model for psychological service which provides the means by which psychological personnel may take the initiative in working in schools. Instead of relying on teacher initiated referrals, psychological services personnel may determine and seek appropriate involvement with students, teachers, administrators and parents.

The Early Identification model also provides a means by which very large numbers of children may receive varying degrees of psychological service. The degree of service is based on needs for service which are determined in consultation with teachers and parents. Efficiency, in terms of percentage of appropriate children receiving service, and effectiveness in terms of percentage of children receiving appropriate service, can be very high. A broad scope of psychological involvement ranging from whole classroom service through service to small groups of students to intensive service for individual children may be provided.

Neither this nor any other model provides an assurance of initiative, effectiveness, efficiency or scope. The fulfillment of these possibilities is dependent upon the abilities, preferences and proclivities of the persons in the educational enterprise who are essential to the successful implementation of these goals.

This manual presents the elements of a technique which has been used successfully. What is discussed here is a framework upon which each individual may build. It is what each person builds which determines the success of the model.

The identification aspect of the program is a process, rather than a single event. The process can be visualized as consisting of several steps: a coarse screening of all children, a finer screening of certain children, a full assessment of a few children, and a follow-up period of one or two years where indicated. This process merges with the service aspect to the child and teacher and is to a degree coincident with it. It involves interaction with the many departments and services within the school system.

The dovetailing of the screening and service aspects are illustrated by the following figures.

Figure 1 illustrates the screening model. In-school service is provided for many children from the brief individual assessment phase onward. On the basis of preliminary assessments some in-class help may be provided without the full diagnostic assessment which is required for more complex or serious cases.

In general terms, what has evolved is a successive sieves model of screening which, in conjunction with the coincidental service aspects of the process, requires a close and ongoing involvement with children, parents, and school personnel.

BEST COPY AVAILABLE

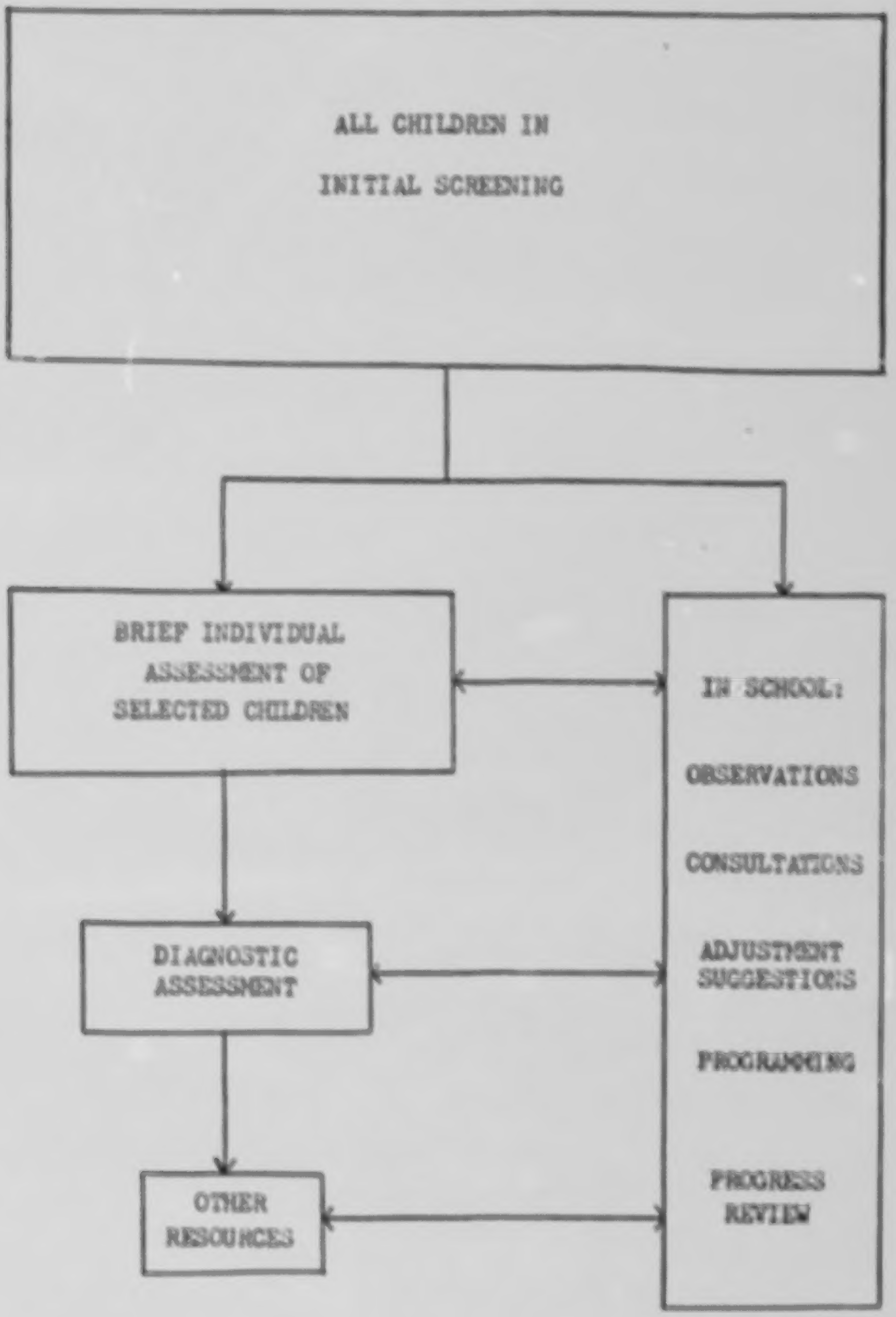


Fig. 1. Successive sieves model of screening employed in the Early Identification and Developmental Program.

The screening aspect of the process is only a small fraction of the time commitment inherent in a successful program. Identification without coordinated ongoing service is useless at best. The importance of screening is the opportunity it affords to provide service of a comprehensive kind in the early school years. Service implies, in this context, not only referral to remedial school programs, but the provision of a "watching brief" on children at risk, the provision of ongoing consultation to teachers and parents and the provision of information to the teacher relevant to programing for the class as a whole.

The identification at an early age of children who are encountering, or are likely to encounter difficulty in school has been accepted as a priority by the Toronto Board of Education. The process of early identification involves a major commitment of resources on the part of psychological and school personnel. Therefore it is necessary for the schools and school boards involved to set priorities regarding psychological services. To detect high risk children early in their school careers, psychological service staff and supporting services must be provided. It is important to discuss the process with teachers and administrators in order to make all those involved aware of the responsibilities incumbent in the program.

Using the results of screening, intervention can be initiated by the psychological services staff member who can then become involved with the classroom teacher in planning for the class as a whole, as well as for small groups within the class, and individual children. Such a preventative approach has many advantages for the child, the school and teacher. Experience has shown that the young child responds more readily to remediation than does the child of nine or more, as he does not have the added emotional burden of several years of frustration and failure. In evaluating every child in a given class, one is able to look at developmental characteristics of the group as a whole as well as strengths and weaknesses in development in individual children. Such an overview is most important in making appropriate and relevant suggestions for individuals or groups of children.

It is vital to be aware of the dangers of "labelling" a child as deficient in some way, and to strive to avoid doing so inadvertently. It is obviously undesirable to weaken a child's self-confidence by singling him out as inadequate. The teacher's perception of the child can influence methods of teaching, and care must be taken that realistic expectations for the child not be undermined. If precautions are taken to minimize this potential hazard, it has been our experience that the advantages of a screening program far outweigh the disadvantages.

A significant function of early screening is to provide a basis for continuing investigation and planning in growth and development. The identification of strengths and weaknesses is only the first step.

BEST COPY AVAILABLE

If the preventative approach in education is to be truly effective, one should have a basic background knowledge about early childhood development or be willing to acquire it (see Bibliography). Such knowledge forms the basis of this approach. The early identification and intervention approach necessitates a different perspective from the psychological staff than that required for the teacher-initiated referral model of psychological service.

The specifics of the program can, and should, be varied to meet the needs of the school and the preferences of the psychological services staff member but the process itself includes several steps which, if systematically followed, will make the screening more effective. The involvement of the staff member with the teacher and students in the classrooms being screened is continuous over the school year, but for convenience the process can be divided into five phases. This procedure remains constant while within each phase many variations occur. As well, the time between each phase may vary from one month to a year or so depending on the individual child. The five phases are:

Preparation - Selection of school and grade, consultation with principals and teachers, and letters to parents
Level One - Initial Screening
Level Two - Brief Individual Assessment of selected students
Level Three - Diagnostic Assessment
Referral to other sources and continuing involvement.

All children in a class will be involved in Level One, and progressively fewer at Levels Two and Three.

The test battery chosen for Level One should provide information concerning the child's social and emotional development as well as motor, language and academic skills. Information about the child's social and emotional development is gained from classroom observations (where the make up of the class as a whole can be seen), teacher consultation and observations during individual test sessions with the child.

Ongoing consultation with teachers allows for regular review, reinforcement and program suggestions. This is the central core of the process of early identification and intervention. Information sharing with parents may occur at any time in the process and provides an important dimension to the service. Figure 2 illus-

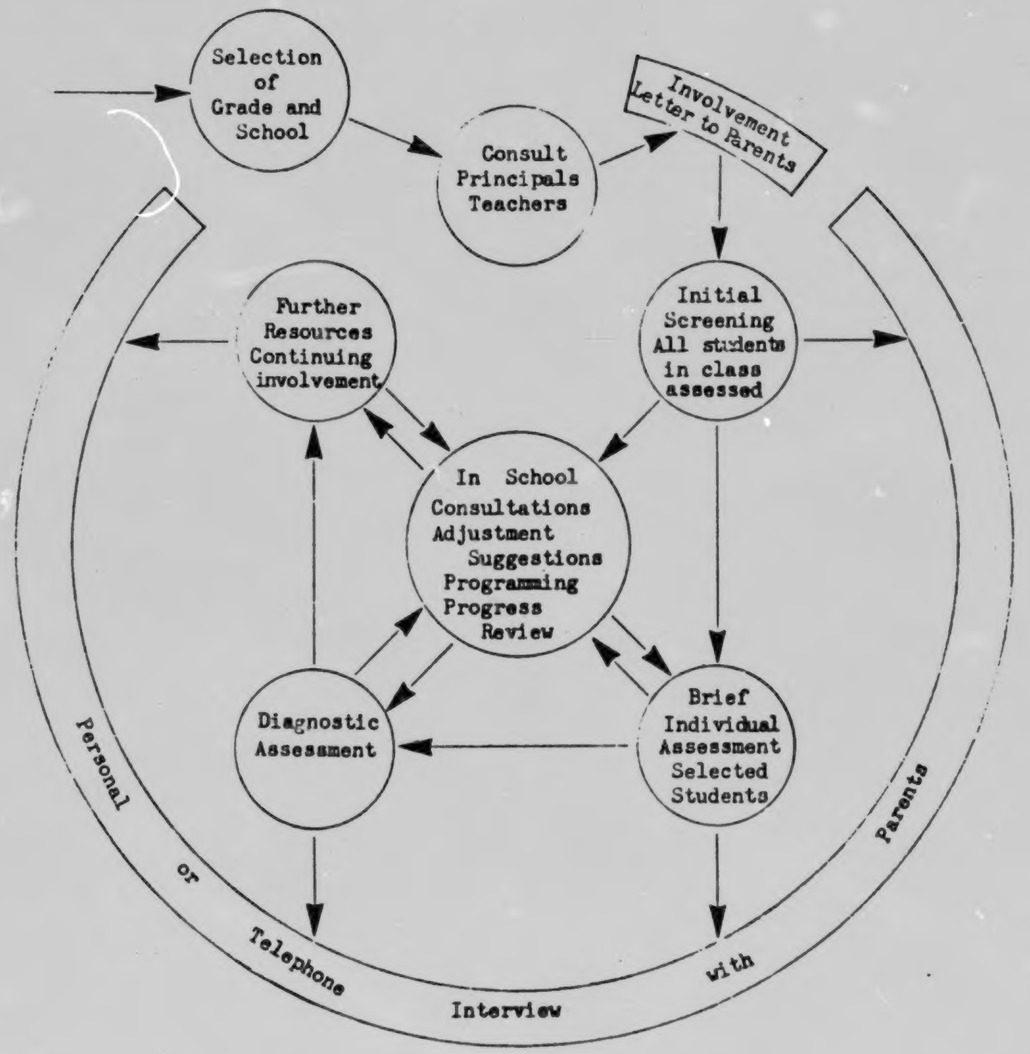

Selection of Grade and School
Consult Principals Teachers
Involvement Letter to Parents
Initial Screening All students in class assessed
Further Resources Continuing involvement
In School Consultations Adjustment Suggestions Programming Progress Review
Diagnostic Assessment
Brief Individual Assessment Selected Students
Personal or Telephone Interview with Parents

Fig. 2. Phases in Early Identification and Developmental Program process.

trates these interactions and the phases in the process of early identification.

The following paragraphs describe more fully the five phases used in screening in the early grades. The tools and techniques suggested here have proven to be successful, but as equally useful ones become available they may readily be incorporated.

Preparation Phase

The psychological services staff member should decide in consultation with the school principals and teachers in which classes an early screening is to be carried out. Cooperation of school personnel is essential for a maximally effective program. School personnel can have important influences on the style and content of the screening program. The choice of tests and interview techniques used in initial screening and the interpretation of test results will be influenced by the nature and composition of the school staff. The screening program should be coordinated with school resources. Such consultation and coordination can have an important educational effect among school personnel. Through experience in the screening process teachers can gain valuable insights into child development.

Long term planning within a specific school is advisable so that every child is included in the screening process at some point in the Primary years. As a general suggestion in short term planning, the earlier in the school year the screening can be arranged, the more time there is available for ongoing planning and adjustments in the children's programs during that school year. For many schools it has been found beneficial to start the Grade One screening in the Fall term and the Kindergarten screening in the Spring term.

The school informs the parents about the screening process. Various types of letters have been used to serve specific needs. The letter chosen must take into account the parent population. Translations into several languages have been prepared for parents who are not fluent in English. Several examples of letters that have been sent to parents are included in Appendix A. In many instances a screening program and the information to and from parents has improved working relationships between the parents and psychological services and the school.

The initial battery should be decided on well in advance so that all materials necessary for Level One screening can be ready and organized before beginning, (paper. pencils without erasers, test booklets, class lists, etc.). Principals and teachers should also be informed of the general outline of screening procedures.

Level I

Level One screening includes all children in the class.

Initial Testing:

Group testing generally takes the form of pencil and paper tasks. The battery used can investigate visual-perceptual-motor and academic skills as well as giving indications of possible social-emotional factors. Before any screening program is established, a thorough investigation of the available assessment techniques and tools should be made. For comprehensive listings and critical reviews of tests see Buros (1965, 1972). The Bibliography lists tests which have been used in this program. Through early screening work, informal techniques for assessing areas such as following instructions, handwork and gross motor skills, have been developed.

The administration of drawing tests for children in the Primary Grades usually takes place in the home classroom. All children can be tested at the same time if the teacher remains in the classroom to help with supervision. Other tests necessitate smaller groups being tested in places other than the home classroom. Kindergarten children are usually withdrawn from the class and tested in groups of about five. The time required for group testing rarely exceeds 20 minutes if the whole class is tested at the same time. The teacher must be consulted about the time of testing so that lessons or projects are not interrupted.

During classroom observation and group testing, information concerning handedness, ability to follow instructions, impulsivity, attention span, ability to work in a group, extreme withdrawal, and similar indications of possible need for further investigation can often be obtained.

As paper and pencil drawing tests, the Perceptual Forms - Draw-A-Person combination and the Kirk XO Test have proven to be effective as a part of the initial group testing. These tests are discussed more fully later in this Report. (See also Appendix B.)

Teacher Interviews:

The teacher's assessment of each child is important throughout the initial screening process. Such an assessment may be obtained quickly by a rating-scale procedure, or in more detail through structured or informal interviews. The procedure outlined here involves an initial rating of every child, and a more detailed discussion about selected children at the time of the meeting with the teacher to discuss test results.

An example of the first of these two ways of obtaining information is a rating scale. The Pupil Description Scale (Appendix C) is composed of two parts: a rating scale consisting of ten items, and a request for the teacher's opinion as to the need for assessment of behaviour, intelligence, verbal or motor skills or physical factors. Copies of the Scale may be given to the teacher during the introductory interview, perhaps to be completed before testing begins. Once familiar with the method, ratings for the entire class can be completed in one half hour or less.

An example of a more detailed interview may be found in the Teacher-Psychologist Interview; this form provides specific guidelines for the investigation of eleven areas. Within each of these areas, specific indicants of possible difficulty are listed. The Teacher-Psychologist Interview form may serve as a tool for the psychological services staff member to use in obtaining more detailed and precise information than the Pupil Description Scale provides. See Appendix C.

It is worthwhile at this point to consult with the teacher on the basis of the information obtained in Level I.

Those children scoring below the criterion score on the various tests and/or those children receiving significant mention in the Teacher Interview are selected for Level II. Consultation with parents interested in group screening results and with parents of children proceeding to Level II may be done at this time.

Level II

Second level assessment involves further testing of the selected children. Although it might ideally be advantageous to see all the children individually it is not always possible or feasible to do so.

An average of twenty to thirty per cent of the children in the initial screening are typically included in Level II assessment. The local needs, resources and priorities should determine the per cent selected for Level II.

This assessment can investigate language skills further as well as continue the investigation of other areas tapped by Level I screening.

Second Level testing provides an important transitional screen. Children who could benefit from some special assistance but who would not likely benefit sufficiently from a complete diagnostic assessment are of particular concern here. Second Level assessment is both a screen which selects a few children for further assessment and a source of information to aid with in-class assistance for a larger number of children. In providing an opportunity to confirm, deny or modify the hypotheses which led to selection from First Level assessment, Level II contributes to the efficiency and effectiveness of the total program.

The tests chosen in Level II are selected on the basis of individual need as evidenced in Level I assessment. The Bibliography lists tests that have been used in Level II assessment. Buros (1965, 1972) should also be consulted.

Referrals for further investigation are often made to Social Work Service, school nurse, physical examination, etc. It is often appropriate at this point to reinvolve the parents to obtain information concerning vision, hearing and health, and to share information from Level II assessment.

For the majority of the children within a specific classroom, enough information has been gathered to discuss the make-up of the total class with the teacher and to make programing suggestions for small groups and individual children. Consult the Bibliography for reference sources which may be used by the psychological services staff member prior to discussing child development, programing suggestions and play activities with teachers and parents.

At the completion of Level II a report of screening is often sent to the school. This report outlines the steps which have been taken, and comments briefly on findings which are significant to the whole class, as well as information on small groups and individual children. See Appendix D. The school is made aware of those children who will be involved in a more intensive investigation.

Level III

Based on information from Level II assessment the children can be divided into three groups:

a) Those about whom there are no spacial concerns.

b) Those who will be tested at a later date to assess changes in development.

c) Those who need more intensive investigation at this time so that enough information is available to plan the appropriate action for the individual child.

In Level III assessment more highly specified information is dealt with. This phase of the procedure is similar to the most intensive aspects of the traditional model of psychological services. Here, complete, intensive assessment is engaged in. It is most important at this Level that assessment be linked to appropriate preventative or remedial activities. While in all Levels there are links to practical suggestions for teachers and others, in Level III the information is much more specialized and suggestions are individually tailored to meet the more demanding needs of the child proceeding through this level of assessment.

The information obtained in Levels I and II is used for specifically designing an assessment battery to be used in Level III.

As a result of the information obtained in Level III, an average of five to eight per cent of the children in the original screening are referred to other resources for additional service.

Referral to Other Resources

An important effect of screening is to prevent or minimize problems rather than to place children with problems in special programs. Very few of the children screened require special program placement. Such placement can often be prevented by early screening and remediation within the classroom and on a withdrawal basis. Some children require further assistance and may need full time placement in a special class for varying lengths of time.

Where special assistance is required Special Education programs are available in Toronto for children with problems in academic achievement, perception, behaviour, reading, English language, health, speech, hearing, and vision. Specially designated schools are available for the deaf, mentally retarded, and for the physically handicapped.

Home Instruction is available for homebound students.

Many referrals are also made to community resources such as hospitals, mental health clinics, Children's Aid Society, Y.M.C.A., Y.W.C.A., A.C.L.D., and Integra Foundation.

Where no class space or program is available, greater emphasis must be placed on in-class procedures and those resources which can be developed in the school and community.

Conclusion

The model of psychological service presented here is a major departure from conventional models of psychological service.

In screening in early grades, the psychological services staff member takes the initiative. The staff member is not dependent on school personnel for case initiation, but instead is in the classroom early in the school year working closely with the teacher on a preventative, remedial and pre-referral basis. This is a major change in approach for many psychological services staff and for school personnel as well.

The approach outlined in this paper brings the psychological services staff into close contact with many educational aspects of the school. As well there is greater involvement with younger children than is typically possible with the crises intervention model of psychological service.

Typically, early screening will be liable to encroachments of crises-intervention activities. Care should be taken to insure that in this circumstance early screening not be slighted. If the early identification program is not allotted sufficient time and resources the resulting partial service will likely be unsatisfactory. Little benefit accrues from the initial screening of a large number of children. Only when preventive work within the classroom and remedial work with individual children is undertaken, do the benefits of the program begin to be seen.

Screening, when properly designed to meet present needs and available resources, can be a most efficient deployment of psychological personnel. It is a technique which can produce an early overview of a very large number of children using a relatively small amount of psychologist time. With slight alterations some of the early aspects of screening and test scoring can be performed by specially trained, non-psychological personnel.

Assessment and remediation are more efficient and effective when they are based on regular consultation. The consultative aspect, the successive filtering by screening, knowledge of childhood development, familiarity with school programs, and a preventive orientation are the essences of a successful early identification program.

RESEARCH REPORT

Previous portions of this report have dealt with an overview of the whole of the Early Identification and Developmental Program and with practical concerns regarding the implementation of an early identification program. The section which follows is a report of the statistical analyses which were performed as part of the research phase of the E.I.D.P. The Research Report deals with several topics including a brief discussion of some sociological factors of importance in Toronto, a pilot study (the Forest Hill report), a description of screening instruments and of instruments to measure the criteria, and a comparison of screening techniques.

Socioeconomic and Language Factors

The population of the City of Toronto is markedly heterogeneous. In interpreting data such as that presented on this report the degree and type of heterogeneity is important. In the course of the Early Identification and Developmental Program several approaches to quantifying the relevant variables were attempted. The most useful information was obtained from the Every Student Survey conducted by the Research Department of the Toronto Board of Education.

Data obtained in the Every Student Survey (Wright, 1970a, 1970b) were used to quantify socioeconomic and language factors for each school. The "lower" socioeconomic category was defined as the percentage of heads of households in the socioeconomic categories of labourers, truck drivers, taxi drivers, waiters, porters, retired, pension, workman's compensation, welfare, mother's allowance, full-time education, unemployed, and housewife. The percentage of the Toronto school population in these categories was 52 per cent. The percentage for individual schools ranged from 3 per cent to 81 per cent.

The language variable was defined as the percentage of students in a school who did not learn English as their first language. This figure includes those for whom English was a second language and those who learned English and another language concurrently. Forty per cent of the Toronto school population did not learn English as a first language. The percentage for individual schools ranged from 2 per cent to 89 per cent.

Figure 3 presents these two variables in graphic format for the population of each Toronto school. In the figure each asterisk represents one school.

From its inception the E.I.D.P. was a mixed service-research project. While the search was continuing for the most effective

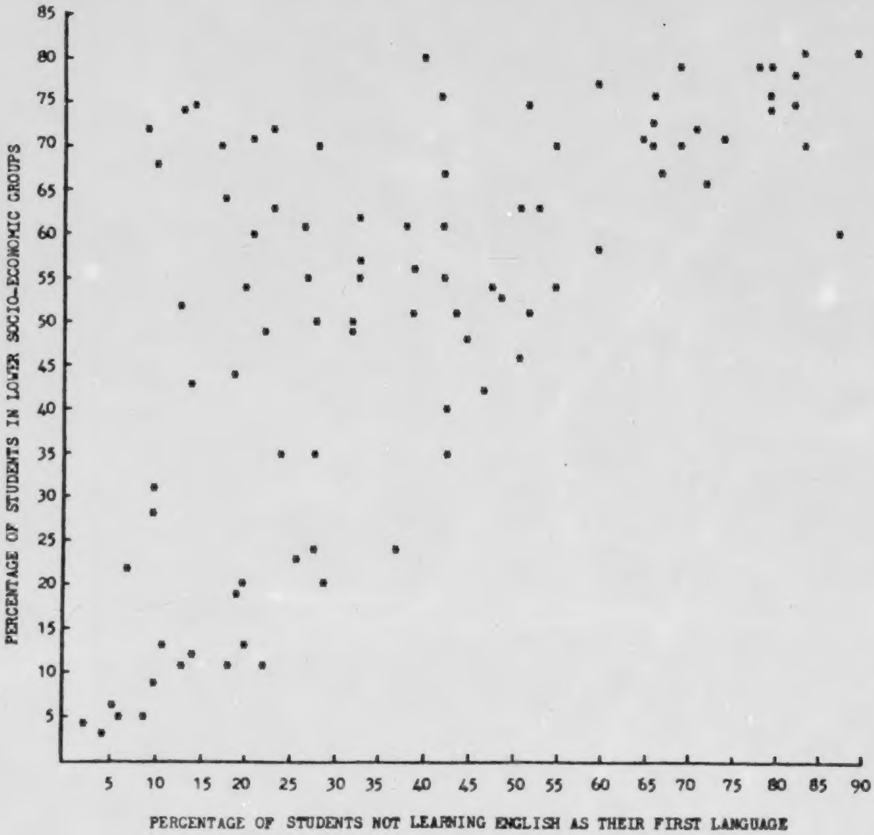


Fig. 3. Socioeconomic and linguistic characteristics of Toronto school populations. For each school the percentage of heads of households in the lower socioeconomic group and the percentage of students not learning English as their first language are shown.

techniques and models of screening, service to children was provided. In the vast majority of instances when there was a possible conflict between these two aspects of the program the service aspect was given priority. It was felt that within the psychological service of an educational setting, the psychological and educational needs of individual children could not be overlooked in the interests of research. Therefore, the research was composed largely of trying several techniques of screening on very large numbers of children and using the results of the screening to implement service to the children selected in the screening. Thus the choice of techniques was always based to a considerable extent, on the probable usefulness of the technique in the service component.

Because of the importance of the service component, the judgments of the staff members in the program were considered seriously in evaluating the various techniques and models of screening. The research and evaluation phases were ongoing and everchanging throughout the course of the project. Several tests were tried at various points during the project by one or several of the E.I.D.P. staff members. If it was felt that any specific test or technique was not effective, that test or technique would likely be discontinued unless there was convincing evidence that there might be merit in further investigation. The tests and techniques that remained in the program, even for research purposes, passed several trials by use in practical decision-making contexts. Therefore, the tests and techniques which are discussed in detail in this report have passed the critical judgment of staff members, and were found to have merit.

In addition to the statistical criteria there are the numerous subjective criteria which the staff employed in working with teachers, administrators, parents, and students. It is these criteria which ultimately determine whether a technique will be used in actual service and whether it will be used in the most advantageous manner. Techniques which have statistical validity but lack staff support will not be appropriately used. It is with some assurance, therefore, that the techniques in this report are discussed.

The Forest Hill report which follows discusses the pilot study which preceded the main E.I.D.P. During the Forest Hill study several instruments and techniques were first developed and used. The Forest Hill study was relatively small compared to the massive numbers of children involved in the other phases of E.I.D.P. The small size of the study made possible detailed follow-up for individual children. The report of this phase of the E.I.D.P. presents a detailed view of aspects of early identification over a span of five years.

The Forest Hill Report

Three schools, with a total Kindergarten population of 163 pupils, and four Kindergarten teachers, participated in this study. The schools are situated in an area of generally upper middle class families.

The socioeconomic and language characteristics of these three schools were as follows:

School	English not first language	Lower socio-economic group
A	22%	11%
B	14	12
C	6	5

These three schools were at the time cooperating in a project of the Metropolitan Toronto School Board (Ginters, 1966). It was decided to use a screening device developed by the Kindergarten Screening Committee to Identify Children with Perceptual-Motor Difficulties for the teacher's survey of the pupils. This committee had as its goal "the improvement and increase in the body of knowledge relative to the perceptually handicapped", and as its first task developed the Teacher's Screening Form to enable the teachers to select high risk children. The Form lists eleven descriptive items, which, if applicable to an unusual degree, were suggestive of behavioural characteristics related to learning difficulties in general and specifically to perceptual handicaps. See Appendix C.

Although the focal point of the Teacher's Screening Form was to be the early identification of students in need of specialized help and training in the perceptual area, it was recognized that the initial rating questionnaire would be a coarse measure that might include pupils with actual perceptual handicaps, pupils who were simply immature in comparison with their classmates, pupils with emotional and social difficulties, and probably also slow learners.

It was anticipated that a secondary level screening of the pupils would further clarify the particular needs and problems of the pupils and would determine whether a full psychological assessment was indicated.

Method

The Form was presented to the teacher by the school psychologist who endeavoured to ensure that each teacher understood all items and interpreted each item in the same way. The four teachers involved were all experienced, familiar with the school system, and shared a common core of educational goals, as well as having a similar understanding and interpretation of the descriptive statements of the Form.

Identification in two or more areas was taken as the criterion score indicating a need for second level screening. As can be seen from Table 1, 114 or 70% of the children were considered by the teachers to show none of the behaviours listed to an excessive degree, and twenty-eight pupils or 17% were identified as showing but one of the behaviours. This left in the initial group selected by the teachers twenty-one pupils (13% of the total group), fifteen of whom were boys and six of whom were girls.

The selection of high risk children was further refined by second level screening consisting of a brief battery of tests administered to each child individually. It consisted of four subtests from the Wechsler Intelligence Scale for Children; Information, Similarities, Vocabulary, and Blocks (VIBS); the Draw-A-Person, the Perceptual Forms, an informal test of general information (How old are you? When is your birthday? What is your telephone number? etc.) and notes on the child's fine motor and gross motor control.

Inclusion in the Selected Group was determined by taking into consideration the presence of any of the following items: a scaled score below 8 on any of the four subtests of the W.I.S.C. (VIBS), difficulty in execution of the Draw-A-Person (i.e., unrecognizable as a figure, presence of fragmentation, perseveration),

TABLE 1

NUMBER OF PUPILS IDENTIFIED BY TEACHER'S SCREENING DEVICE

Number of Areas Checked	Number of Pupils	Percentage
5	1	0.61
4	6	3.68
3	8	4.91
2	6	3.68
1	28	17.18
0	114	69.94
TOTAL	163	100.00

or the Perceptual Forms (inability to reproduce the circle, cross, square, wavy lines), difficulties in the fine or gross motor area detected through observation of the child's performance and any indication of emotional concern revealed in any part of the interview with the child.

On the basis of this second level screening the development of three of the twenty-one teacher-selected children in the initial group was felt to be within the normal range. This left eighteen whose possible difficulties merited further exploration. These eighteen, five girls and thirteen boys, selected on the basis of both the Teacher's Screening Form and the individual tests, were designated the Selected Group.

The remaining 145 children, that is all those not selected by the screening process of the Teacher's Screening Form and individual tests, were designated Non-selected.

These groups are coherent groups only in the sense that they were so categorized in the research described in this study. None of the school staffs was aware of the existence of the groups as such. Information was retained in a separate research file and school files were not distinguished in any way.

As individual needs arose the children received the school services, regardless of whether they were in the Selected or

Non-selected Group. Referrals were made to psychological services, and were handled independently and on an individual basis.

The screening process will be discussed first in relation to a fuller psychological assessment administered at Kindergarten level. A comparison is then made between those pupils selected by the screening process and those not selected. Finally consideration is given to individual cases in the Selected and the Non-selected Groups.

Comparison of Selected and Non-selected Groups

In evaluating the screening process, as the children were followed through five years, the Selected versus the Non-selected Groups are compared as groups with respect to academic achievement, reading achievement, rate of school progress and difficulty in school adjustment.

Academic achievement was measured by the Teacher's Rating Chart administered at the end of the first, second, third and fourth years after Kindergarten. Sixty-five per cent of the charts for the third year were lost in transit before the data were consolidated, and thus this year's ratings were discarded and not considered in the data analysis.

Reading achievement was measured by the Gates-MacGinitie Reading Tests at the end of the third year (Form C) and the fourth year after Kindergarten (Form D).

Rate of progress in school was measured by grade placement in the fifth year after Kindergarten.

Difficulties in adjustment (academic, social and emotional) serious enough to warrant referrals made by the teacher or principal to psychological services were noted.

Teacher's Rating Chart

Examples of the Teacher's Rating Charts are to be found in Appendix E. The chart when completed by the teacher provides a summarized statement of each child's achievement at that time. The four items of the chart administered at the end of the first year in the Primary Division dealt with:

1. The Level of Instruction in Reading.
2. Reading performance.
3. Performance in mathematics.
4. General performance and diligence.

Gates-MacGinitie Reading Test

Form C of this test was administered by the school staff to the pupils in their expected grade placement (Grade III) and Form D was administered at the end of the following year in the expected grade placement (Grade IV). Eight children were omitted at the time the Gates-MacGinitie Reading Test was administered at the end of the fourth year as they were not in any of the expected rooms in which the tests were administered. These children wrote the test nine months later than the other children. The appropriate norms (grade five years, five months) were used in obtaining standard scores, which were then used in the analysis. Two children were unable to cope with the test at all (Form D) and these were assigned the lowest standard scores.

Placement

Grade Placement for each pupil in his fifth year after Kindergarten was ascertained from school records.

Referrals

Referrals to psychological services were enumerated through a scanning of school records, through a search of central files, through information supplied by Special Education Consultants, and in some cases through telephone calls to parents. In cases in which a child had left the Toronto system, and it was possible to trace his whereabouts, contact was made with his current school regarding his progress.

An analysis was made of the kind of problem revealed in psychological and educational assessments, and the kind of special services required in amelioration of the problem.

Psychological Assessment at Kindergarten level

The assessment of each of the eighteen children selected as high risk in the screening process included observation of the child in the classroom, an informal interview, and the following formal tests: Stanford-Binet, Frostig Developmental Test of Visual Perception, Perceptual Forms, Draw-A-Person, Wepman Auditory Discrimination Test and Kephart's Perceptual-Motor Survey.

A brief medical summary was supplied by the school nurse for each child. This summary was based upon a parent interview, the nurse's notes and observations, and any reports available from the child's pediatrician or family doctor. It included a summary of the child's present health, a developmental history and general observations. See Appendix F.

Upon completion of the gathering of observational data, the interviews with the child, the medical summary and the administration of the tests, a forced diagnosis was made by tentatively assigning each child to one of the following categories:

> Perceptual inefficiency with immaturity, but with the perceptual inefficiency as the predominant factor;
>
> Immaturity with some perceptual inefficiency;
> Immaturity without demonstrable perceptual inefficiency;
> Emotional problems with possible perceptual inefficiency;
> Emotional problems without perceptual inefficiency.

This forced diagnosis was purely for research purposes and in no way implies that it was the usual procedure used. The diagnosis was not made known to the school staff or other members of the psychological services staff who might have later contacts with the children.

Results

It will be recalled that of the original twenty-one teacher-selected pupils, three were found to not exhibit problems sufficient to warrant a full psychological assessment. Upon completion of the psychological assessment the remaining eighteen gave evidence, in varying degrees, of some difficulty in terms of perceptual problems, immaturity or emotional problems. There was considerable overlap, as most of the eighteen children displayed difficulties in more than one area, but each one was assigned to the forced diagnosis category in which the indicated characteristic was predominant. Fourteen (67% of the original twenty-one pupils selected by the Teacher's Screening Form) revealed evidence of perceptual inefficiency in the psychological examination at the Kindergarten level. In four cases (19%) difficulties which might contribute toward a high risk of later difficulty in school, but which did not involve apparent perceptual inefficiency, were noted. The Teacher's Screening Form did, therefore, select pupils showing some perceptual inefficiency as confirmed by the psychological assessment. The Form also selected some potentially high risk children with other than perceptual problems, and, as is expected in any initial screening device, it included borderline children who were eliminated at the secondary screening level. See Table 2.

Academic Achievement

In order to test the effectiveness of the selection techniques, comparisons were made between the children selected by the Screening Process (i.e., the *Teacher's Screening Form* and the individual testing) and those not selected. Analysis was carried out in terms of the difference of the means of scores obtained on the *Teacher's Rating Chart* and the *Gates-MacGinitie Reading Test*, statistical significance being determined through application of the t test.

The Level of Instruction in Reading item from the *Teacher's Rating Chart* is quantified as follows:

1. Readiness material
2. Chart reading
3. Pre-primer
4. Primer
5. First part of Book I
6. Second part of Book I
7. Book IIa (first half Gr.II)
8. Book IIb (last half Gr.II)
9. Book IIIa (first half Gr.III)
10. Book IIIb (last half Gr.III)
11. Book IV (Gr. IV)
12. Beyond Book IV.

BEST COPY AVAILABLE

TABLE 2

FORCED DIAGNOSIS: PRESENCE OF PERCEPTUAL INEFFICIENCY REVEALED IN PSYCHOLOGICAL ASSESSMENT AT KINDERGARTEN LEVEL

Diagnosis	Number of Pupils	Percentage
Perceptual Deficiency predominant factor	4	19.05
Developmental lag with some perceptual inefficiency	6	28.57
Emotional Problems with some perceptual inefficiency	3	14.28
Full Assessment deferred because of foreign language background, but some perceptual inefficiency	1	4.76
Developmental lag without evident perceptual inefficiency	1	4.76
Emotional Problems without evident perceptual inefficiency	3	14.28
No difficulties indicated in screening tests	3	14.28
Total Identified by Teacher (Teacher's Screening Device)	21	99.98

There is a significant difference in instructional reading levels throughout the four years after Kindergarten. (See Tables 3 and 4.)

By the end of the first year the average instructional level in reading for the Non-selected children, as measured by the Teacher's Rating Chart, was at the end of Book I, while that of the Selected children was at the Primer level. By the end of the second year, the average instructional level for the Non-selected children was at the end of Book II and that of the Selected Group was at the end of Book I. At the end of the fourth year the average instructional level of the Non-selected children was in Book IV while that of the Selected children was at the end of Book III.

In mathematics, too, there was a statistically significant difference in mean instructional level. The Selected children at the end of the fourth year were on the average completing the material of Book III, while the Non-selected children were completing Book IV.

The quality of the pupil's work, general performance level, diligence, understanding of mathematical concepts, reading performance as measured by the Teacher's Rating Chart, all yield a statistically significant difference in the means in favour of the Non-selected Group.

BEST COPY AVAILABLE

TABLE 3

TEACHER'S RATING CHART, MEANS AND t: FOR THE SELECTED AND NON-SELECTED GROUPS

Teacher's Rating Chart	Means					
	Selected Group	Unselected Group	Difference	N	t	p <
End of Grade One						
Present Level of Instruction in Reading	4.22	5.99	1.77	141	5.90	.001
Pupil's Reading performance	2.50	3.45	0.95	141	2.30	.011
Pupil's ability to understand mathematical concepts and operations	2.72	3.36	0.64	141	3.12	.001
Pupil's general performance level	2.27	3.35	1.08	141	4.33	.001
End of Grade Two						
Present Level of Instruction in Reading	6.39	8.16	1.77	107	5.53	.001
Pupil's Reading performance	2.82	3.48	0.66	106	2.93	.002
Pupil's ability to understand mathematical concepts and operations	2.76	3.32	0.56	106	2.77	.003
Pupil's general performance level	2.67	3.42	0.75	103	3.00	.001
Pupil's diligence	2.73	3.49	0.76	102	2.40	.008
End of Grade Four						
Present Level of Instruction in Reading	9.94	11.17	1.23	109	5.59	.001
Pupil's Reading performance	2.82	3.68	0.86	109	3.20	.001
Present level of instruction in Mathematics	7.47	9.16	1.69	109	6.10	.001
Pupil's ability to understand mathematical concepts and operations	2.70	3.49	0.79	109	2.34	.010
Pupil's general performance level	2.80	3.49	0.69	104	2.67	.004

TABLE 4

MEAN READING ACHIEVEMENT

GATES-MacGINITIE READING TEST

Gates-MacGinitie Reading Test	Selected Group	Unselected Group	Difference	N	t	p <
End of Grade Three						
Vocabulary	49.00	57.53	8.53	102	5.16	.001
*grade equivalent	(3-7)	(5-3)				
Comprehension	51.69	56.67	4.98	107	2.78	.003
grade equivalent	(4-5)	(5-4)				
	Selected Group	Unselected Group	Difference	N	t	p <
End of Grade Four						
Vocabulary	51.41	56.73	5.32	97	2.71	.003
grade equivalent	(5-0)	(6-2)				
Comprehension	49.44	55.19	5.75	99	2.80	.003
grade equivalent	(4-8)	(5-8)				
Number attempted	50.41	53.89	3.48	100	2.23	.013
grade equivalent	(5-1)	(6-6)				
Number correct	52.17	56.10	3.93	100	2.44	.007
grade equivalent	(5-5)	(6-3)				

* Grade equivalents here refer to norms of the test and not to grade levels in the schools.

Standard scores were used in the data analysis with respect to reading achievement as measured by the Gates-MacGinitie Reading Test. These scores have a mean of 50, a range of 29 to 75, and a standard deviation of 10. The scores on this test may be converted to grade scores as well and are also indicated in Table 4. The mean score of the Non-selected Group exceeds the mean score of the Selected Group on both the Vocabulary and Comprehension scales at the end of the third year and again at the end of the fourth year by a statistically significant difference. Expressing this difference in terms of grade levels derived from test norms, the Non-selected Group was ahead of the Selected Group by a year or more at the end of the third year after Kindergarten. This difference was maintained at the end of the fourth year.

While the differences in means are statistically significant and provide evidence of a difference between the groups, there is a wide range from lowest to highest score on every item and considerable overlap between the two groups. At the end of the first year, for example, children in the Selected Group had Levels of Instruction in Reading ranging from Readiness material to Book II level, while the range for the Non-selected Group was from Pre-primer to the end of Book II. Similarly at the end of second year the range for Selected children was from Pre-primer to beginning Book III, while the Non-selected children ranged from the end of Book I to the end of Book III. By fourth year the lowest children in the Selected Group were beginning Book II level, while the lowest children in the Non-selected Group were completing Book II. Two children in the Selected Group were working at the ceiling on the scale, beyond Book IV level.

The two children in the Selected Group who did well in terms of academic achievement deserve special mention. One child selected in the screening process as a child of high risk academically, had a psychological assessment at Kindergarten level which revealed no specific perceptual inefficiency, and in forced diagnosis was categorized as immature in relation to his age mates as well as young in relation to Kindergarten children (November birthdate). Subsequent information confirmed the original impression that here was a child with no particular problems who would make satisfactory progress in school provided he was permitted to move slowly at first. This kind of child frequently runs into severe difficulty if he is pushed too hard or exposed to too advanced material in the early stages of his schooling, but progresses satisfactorily if given adequate time and experience with work at his own level during the early stages. The other high achiever in the Selected Group revealed problems in the emotional area without any perceptual inefficiency. Her adjustment gradually improved and no longer interfered with her classroom work so that by the third year she was making good progress academically.

A comparison is also made between the Initial Group selected by the Teacher's Screening Form alone and the remainder of the children. Differences in means of the two groups are again evident, although not as great as the differences between the groups selected by the Teacher's Screening Form combined with the individual testing. See Tables 5 and 6.

The Teacher's Screening Form then makes a useful first level screening and through its use the teachers were able to pick out high risk children, a large proportion of whom were indeed vulnerable and in need of supportive and specialized help of various kinds. The success and usefulness of such a screening device is dependent in large part upon the competence and the experience of the teachers using it. The teachers involved in this study were all experienced and knowledgeable and were accustomed to close observation of their pupils, and to the use of a variety of rating scales. It is not to be expected that all teachers, particularly the very new and inexperienced ones, would be as accurate in their predictions.

The accuracy of prediction is improved by the use of a two-step Screening Process which combines a teacher selection, such as the Teacher's Screening Form with a brief psychological assessment.

TABLE 5

TEACHER'S RATING CHART

MEAN INSTRUCTIONAL LEVEL IN READING

Teacher's Rating Chart	Selected by Teacher's Screening Form	Unselected	Difference	N	t	p <
End of Grade One	4.52	5.98	1.46	141	5.12	.001
End of Grade Two	6.60	8.15	1.55	107	5.74	.001
End of Grade Three	10.11	11.17	1.06	109	4.61	.001

MEAN INSTRUCTIONAL LEVEL IN MATHEMATICS

Teacher's Rating Chart	Selected by Teacher's Screening Form	Unselected	Difference	N	t	p <
End of Grade Four	7.68	9.15	1.47	109	5.25	.001

TABLE 6

MEAN READING ACHIEVEMENT

GATES-MacGINITIE READING TEST

Reading Achievement	Selected by Teacher's Screening Form	Unselected	Difference	N	t	p <
End of Grade Three						
Vocabulary	50.53	57.47	6.49	102	3.25	.001
Comprehension	53.13	56.54	3.41	107	1.42	.078
	Selected by Teacher's Screening Form	Unselected	Difference	N	t	p <
End of Grade Four						
Vocabulary	52.84	56.51	3.67	97	1.36	.087
Comprehension	50.89	55.02	4.13	99	1.68	.047
Number attempted	50.68	53.91	3.23	100	1.27	.102
Number correct	52.5[illegible]	56.11	3.53	100	1.29	.099

Grade Placement

Another indication of successful performance in school is in terms of the rate at which the pupils move through the grade levels. At the end of year five, 123 (98%) of the Non-selected Group were at the expected grade level or higher (i.e., in Grades VI and VII). In the Selected Group, eleven (65%) were at Grade V level and none were higher. Only two children in the Non-selected Group were functioning below grade level expectations and were placed in Special Class. In the Selected Group six children (35%) were functioning below grade level, two of them in Grade IV and four in Special Class. See Table 7.

Referrals to Psychological Services

One indication of a child's difficulty in functioning adequately in school is referral to psychological services. A further measure would be in terms of special educational services required in an attempt to alleviate the pupil's difficulties and to promote improved functioning in school. Special service might consist of providing the teacher with consultant and supportive services to enable her to work out and carry through an individualized program for a particular child within the classroom. It might be provided by the Reading or Primary Consultant. In some cases it might involve Social Work Services or Psychiatric consultation. For children with more serious learning difficulties

TABLE 7

GRADE PLACEMENT IN FIFTH YEAR AFTER KINDERGARTEN

(Expected level, Grade V)

Grade Placement	Selected at Secondary Screening level		Non-selected at Secondary screening level	
	Number	Percentage	Number	Percentage
Special Class	4*	23.53	2**	1.60
Grade IV	2	11.76	0	
Grade V	11	64.71	103	82.40
Grade VI	0		19	15.20
Grade VII	0		1	.80
Total	17	100.00	125	100.00
In Foreign Country	1		6	
Not Traced	0		14	

*2 remaining in Special Class
1 integrating at IV
1 integrating at V

**1 integrating at IV
1 integrating at V

a withdrawal program with teachers from the Special Education Department and the Reading Clinic were available. For the children with more severe disability Special Classes were provided.

Fifteen of the seventeen children in the Selected Group (88%) were referred to psychological services during the five years following Kindergarten. Twenty-four of the 125 in the Non-selected Group (19%) were referred. In Table 8 a summary of the kind of difficulty revealed is shown.

Eleven children (65%) of the Selected Group of seventeen experienced academic difficulty associated with some perceptual problems, while six children (5%) of the Non-selected children experienced such difficulty and required some form of specialized assistance.

An estimate of the severity of the disability can be made in terms of the kind of specialized assistance required to enable each child to cope in the school situation. This varied from individualized help given by the classroom teacher within the classroom, to a withdrawal program with progress through the grades at the normal rate, to withdrawal program with an extra year in Primary Division, to Special Class placement. See Table 9.

TABLE 8

NATURE OF DIFFICULTIES REVEALED IN ASSESSMENT OF PUPILS REFERRED TO PSYCHOLOGICAL SERVICES

Difficulty	Selected Group		Non-Selected Group	
	Number	Percentage	Number	Percentage
Question raised by parent or teacher - no academic nor school adjustment problem	0		4	3.20
No academic problem	2	11.76	4	3.20
Academic difficulty, multi problems with severe unfavourable social situations the predominant factor	0		2	1.60
Academic difficulty, but no evidence of perceptual problem	2	11.76	8	6.40
Academic difficulty with perceptual problem	11	64.71	6	4.80
Total Referrals	15	88.23	24	19.20
Not referred after Kindergarten	2	11.76		
Not referred			101	80.80
Total	17	99.99	125	100.00
Left Country	1		6	
Not Traced	0		14	

TABLE 9

SEVERITY OF LEARNING DISABILITY IN TERMS OF HELP RECEIVED FOR CHILDREN WITH PERCEPTUAL DIFFICULTY

Help Received	Selected Group showing some Perceptual Problems	Non-selected Group showing some Perceptual Problems
Special Class Placement	4	2
Withdrawal program, plus extra year in Primary Division	2	0
Withdrawal program (progress through grades at normal rate)	2	1
Difficulty handled within classroom by classroom teacher	3	3
Number having some form of special help	11	6
Total in group	17	125
Percentage of total in each group requiring some form of specialised help	64.71%	4.80%
In Foreign Country	1	6
Not Traced	0	14

Of the four children in the Selected Group who were diagnosed in Kindergarten as having relatively severe perceptual problems all required Special Class placement of from one to three years.

All six of the children in the Selected Group who were diagnosed as having some perceptual inefficiency along with more generalized immaturity required some form of specialized assistance. Withdrawal program was required for four children, two of them needing four years to complete three years of school. Two, who were experiencing minimal academic problems, received individualized help within the classroom.

Of the three children in the Selected Group who revealed emotional problems with some perceptual inefficiency, one required individualized help within the classroom. The other two children experienced no academic difficulties and gained in visual-perceptual-motor efficiency as their emotional problems subsided.

The screening process identified several high risk children who, as they moved through the next five years of school, experienced difficulty sufficient to require additional help to enable them to cope with the school program.

A similar analysis was made for the Non-selected children.

Six of the original 145 pupils in the Non-selected Group had moved out of Canada, and it was not possible to trace an additional fourteen. From the remaining 125 pupils, twenty-four (19%) were referred to psychological services at some time during the five years. Available information concerning these cases included school records, psychological reports, social work summaries and school health records. As can be seen from Table 8, eight of the twenty-four cases involved no academic problem. Two cases were obviously multiproblem, but with the social situation so severely unfavourable that it was not possible to weight appropriately other factors which might possibly have been involved. Eight pupils were experiencing academic difficulty, but there was no evidence of perceptual problems. The remaining six cases are of primary concern.

Three of these children experienced mild and transient academic difficulty. Psychological examination indicated minor perceptual problems. Some adjustment was made within the classroom and help was provided by the regular teacher in consultation with the staff member of psychological services or the Reading Consultant. These three children have since progressed at the regular rate through school and no further referrals were made.

One child was not selected by the Teacher's Screening Form since the criterion score was a check in two areas. She did receive one check on the Teacher's Screening Form as she tended to avoid activities involving cutting, pasting and fine hand work. She was considered young (August birthdate) and immature in relation to other children in the Kindergarten. Referral to psychological services was made at the end of Grade I. Psychological assessment revealed the presence of visual-perceptual-motor problems. Excessive parental pressure on the child was becoming more evident and seemed a complicating factor in relation to the child's school work. Withdrawal Program was recommended through the Learning Clinic and was begun in Grade II, when the Special Education Department provided an Itinerant Teacher. Two years later a review of her case in Learning Clinic led to Special Class placement, in conjunction with partial integration into the regular Grade IV class. At Grade V level she was fully integrated into the regular stream.

Another child was not selected by the Teacher's Screening Form. His distractibility and restlessness were recognized by the Kindergarten teacher and attributed to the fact that he was young (December birthdate) and immature. A Grade II referral was made, largely because of his mother's concerns about possible perceptual problems. Psychological assessment revealed the presence of some minor difficulty of this kind. A review of the case in Learning Clinic led to provision of Itinerant Teacher service for a period of six months at which time the child was functioning adequately at Grade III level in a regular grade. He continued to move along with his class and was in Grade V.

The third child was neither selected by the Teacher's Screening Form, nor referred to psychological services until the fourth year after Kindergarten. He was, however, referred in September of Grade II to the Language Study Centre as he had virtually no sight vocabulary. The Language Study Centre report indicated that he had the characteristics of a child who is slower in developing than the average child. A short attention span, difficulty with fine muscle coordination, poor retention of visual material and limited recognition of initial sounds were specifically mentioned. He was admitted to Special Reading Class immediately and without psychological assessment. A subsequent psychological report, at ten years of age indicated that he was a boy of average intelligence for this school population (Wechsler Intelligence Scale for Children - verbal intelligence quotient - 114, performance intelligence quotient - 104) who had considerable difficulty in relating meaning and symbol, in spatial organization, in integration, and in retention of both auditory and visual material. He remained in Reading Class three years and returned to a regular class at Grade IV level (one year below expected grade level).

The first two of these three children would have been identified at Kindergarten level had one check on the Teacher's Screening Form been the criterion score. In view of the fact that this would have entailed a psychological screening of 30% of the classes instead of 13%, there is a very real question as to whether this is economically feasible. Obviously the more children it is possible to include in the second level screening, the less chance there is of omitting a child who could well profit from specialized help at an early stage in his schooling.

The evidence indicates that the difficulties of the third child did not become noticeable until after his exposure to the Reading Program. Apparently he was able to function adequately through most of the first year as well as in the Kindergarten situation without revealing any specific difficulty. It may be that more recent developments of the screening procedure might pick up children of this sort at the earlier stage. It is possible that a second level screening would have selected this child. There is some indication that this last is the most likely possibility.

In summary, the Screening Process differentiated two groups of children, one high risk with respect to future school progress (Selected Group); the other likely to progress satisfactorily in school (Non-selected Group).

School progress during the next five years showed that the Selected children gradually fell behind in instructional level in Reading and Mathematics, and succeeded less well on Reading tests. A higher percentage required special educational services and/or additional time to complete the first four grades of school.

This study constituted the first phase of the E.I.D.P. The design of later phases of the E.I.D.P. evolved from the experience of this pilot study.

Statistical Procedures

As discussed in the Manual, the initial screening of students is accomplished by interviews with teachers and group testing.

During the initial phase of the Early Identification and Developmental Program three group tests were used extensively. The Draw-A-Person test (Measurement of Intelligence by Drawings, Goodenough, 1926; Children's Drawings as Measures of Intellectual Maturity, Harris, 1963), and the Perceptual Forms test (1969) are typically used together. See Appendix B for information concerning administration, scoring and interpretation of these tests.

The Kirk XO Test was also used extensively. This group test was developed during the course of the E.I.D.P. and data from

E.I.D.P. administrations were used in its standardization. The XO is a paper-pencil test wherein the child is asked to reproduce various patterns of X's and O's. The Kirk XO Test is discussed more fully later in this report.

During the evolution of the E.I.D.P. the Teacher-Psychologist Interview came to be used in conjunction with the D.A.P. and Perceptual Forms or in conjunction with the XO Test. Thus, two packages emerged to be used in initial screening: T.P.I. -D.A.P. - Perceptual Forms, and T.P.I. - XO.

The statistical design of this report is twofold. The major selection devices are compared in terms of the correlations of initial test score and Level of Instruction in Reading (as measured by Teacher Rating Chart) at the end of the school year. The correlation, therefore is predictive rather than concurrent. Because of the difficulties in obtaining objective measurements of the multiplicity of elements comprising success in school, Level of Instruction in Reading was selected as the primary criterion. Level of Instruction in Reading was found to be the single most pervasive and measurable variable which could be feasibly obtained. Additional criteria were included in non-statistical evaluations. The end-of-year Teacher Rating Chart, which includes Level of Instruction in Reading may be found in Appendix E.

The other statistical analyses are based on comparisons of the students selected after the initial or second level of screening with the students not selected for further assessment. The comparison of these two groups of students is done in terms of the Level of Instruction in Reading at the end of the school year.

Additional factors influencing decision-making regarding these two screening packages are also discussed.

It should be noted that the correlational phase of analysis is helpful in selecting instruments which could be considered in a screening program. As pervasive as reading is, it is not the whole of education and therefore cannot be adopted as the only criterion for evaluating screening instruments. The correlations obtained between the selection tests and Level of Instruction in Reading should be seen as a guide and general indicator of part of what the tests are measuring and the extent to which that measurement is reliable over time.

In terms of more practical decision-making concerns, the analysis of the performance of the children selected for follow-up in comparison with the performance of the children not selected for follow-up is more meaningful. The extent to which the Selected Group performs less well than the Non-selected Group is one indication of the effectiveness of the selection technique.

At the time these data were collected the focus of the E.I.D.P. was primarily on identifying and helping the high risk children in greatest need. The help was at that time seen as being most probably available in Special Education programs. There was very little of the ongoing process of in-classroom consultation with teachers which characterizes the E.I.D.P. in its present form. This process of continuing involvement with the teacher evolved from experience with prior models of early identification.

The earlier model did not serve children as well but had one research-oriented advantage. At the time of data collection the children who were selected for follow-up typically did not receive in-class remedial help. After the screening phase, the child and class proceeded largely as they had before screening, while the child's case was processed for placement in a special class. Therefore, the end-of-year teacher ratings were not confounded by additional special instruction and other program modifications during the school year.

Because of the amount of in-class consultation which is now carried out as a result of the E.I.D.P., such research would not now be possible.

BEST COPY AVAILABLE

The following section presents a description of screening instruments, including a discussion of the Kirk ID Test. Data concerning the criteria measures, Level of Instruction in Reading and the Gates-MacGinitie Reading Tests, are also presented.

Predictors

Teacher-Psychologist Interview Distributions

The frequency distributions of number of items checked on the Teacher-Psychologist Interview form for both Kindergarten and Grade One are nearly identical in shape. A copy of the T.P.I. form may be found in Appendix C.

In the Kindergarten group 34 per cent of the children screened are listed in one or more of the categories in the interview schedule. In the Grade One group 39 per cent of the children screened are listed in the interview schedule. There is very little meaningful difference between Kindergarten and Grade One children in terms of the per cent listed and the frequency of multiple listing on the interview schedule. However, slightly more Grade One than Kindergarten children would be selected if mention on Teacher-Psychologist Interview were taken as the criterion for selection.

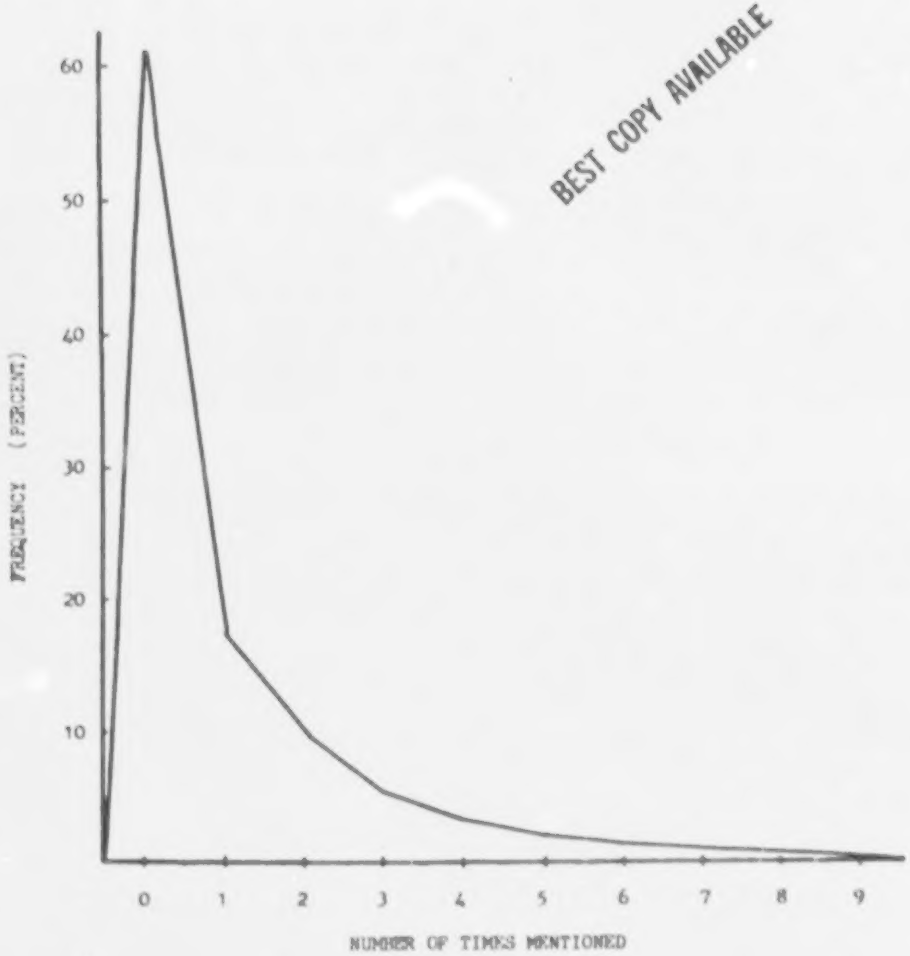
Multiple mentions on the interview schedule could be used as a selection criterion and would, of course, yield smaller numbers of children selected. If two or more mentions were set as the criterion score approximately 22 per cent of those screened would be selected. A criterion score of three or more would yield approximately 13 per cent selected. A criterion score of four or more mentions would yield approximately 8 per cent selected. Approximately 16 per cent of those children listed on the interview schedule are mentioned only once. See Figures 4 and 5.

D.A.P. I.Q. Distributions

The D.A.P. I.Q. frequency distributions for both Kindergarten and Grade One children are generally normal in shape and very similar in that the mean I.Q. scores are nearly identical. The transformation from raw score to I.Q. score is effective in accounting for age effects in that older children do not achieve a higher mean score than younger children.

There is a smaller range of scores among the Grade One children than among the Kindergarten children. The Grade One scores tend to be more concentrated around the mean and less dispersed than the Kindergarten scores.

The obtained mean scores (101.9, 101.4) are nearly two points higher than the theoretical mean I.Q. score of 100. This difference has little practical importance however.



BEST COPY AVAILABLE

Fig. 4. Frequency distribution of the number of items on the Teacher-Psychologist Interview in which students are mentioned. The Teacher-Psychologist Interview was administered in the Fall in Grade One, N = 4107.

BEST COPY AVAILABLE

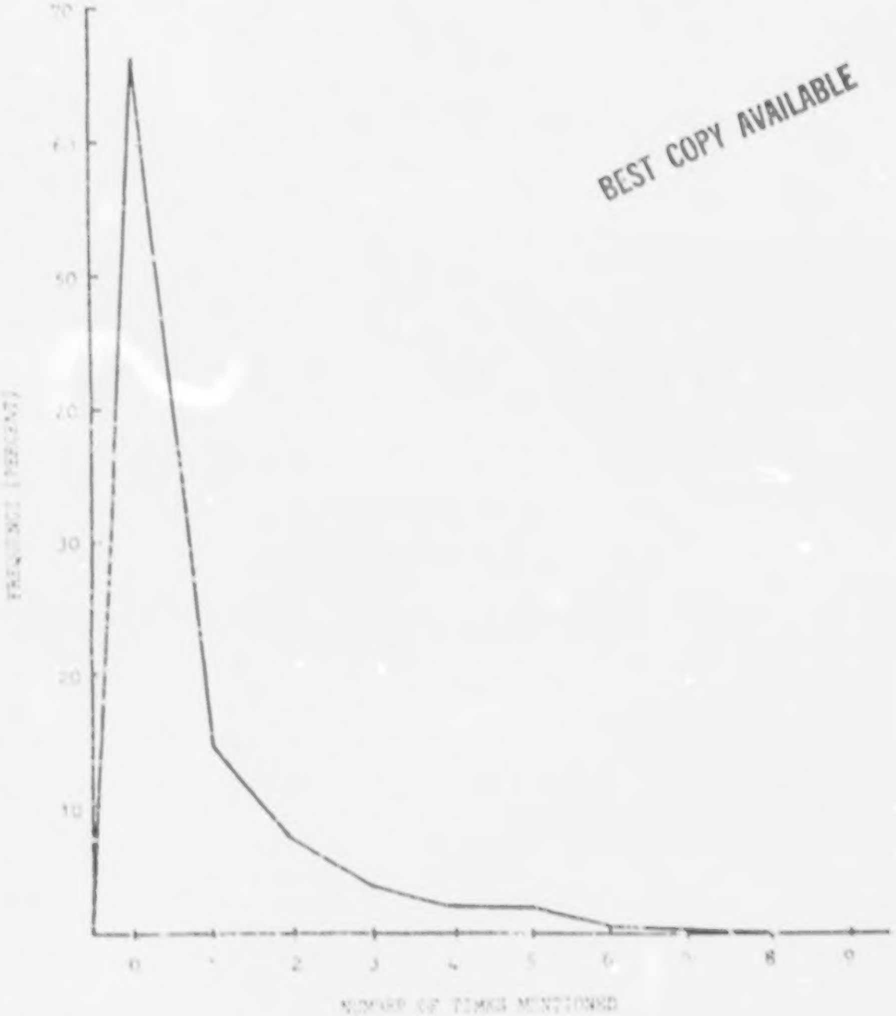


Fig. 5. Frequency distribution of the number of items on the Teacher-Psychologist Interview in which students are mentioned. The Teacher-Psychologist Interview was administered in the Spring in Kindergarten, N = 947.

BEST COPY AVAILABLE

In terms of criterion scores for selection purposes there is considerable difference between the Kindergarten and Grade One distributions. If children with D.A.P. I.Q. scores below 80 are chosen to be selected, in the Kindergarten sample 9 per cent of the children tested would fall below the criterion score. In the Grade One sample slightly over 4 per cent of the children would be selected as having scores below the criterion score of 80. To obtain 9 per cent selected in Grade One the criterion score would have to be raised to 84.

Among the lowest scores of the distributions there are proportionately more Kindergarten children than Grade One children. This suggests that the I.Q. transformation is not as effective for the lowest scoring Kindergarten children as for those who score near the mean or above. For both distributions 34 per cent of the children have scores lower than 95.

Because of the differences in performance between the Kindergarten and Grade One children as indicated by the differences between the distributions, low D.A.P. I.Q. scores should be interpreted with caution. It appears that children who obtain low scores in Kindergarten would probably obtain slightly higher scores in Grade One. When the D.A.P. is used as a tool in initial selection, these differences are of minimal importance except for the possibility of over selection in the Kindergarten group. See Figures 6 and 7.

Perceptual Forms Total Scores Distributions

The Kindergarten and Grade One Perceptual Forms frequency distributions are both approximately normal in shape.

However, the Perceptual Forms distributions reveal considerable differences between the Kindergarten and Grade One children. The Grade One distribution has a smaller range of scores than the Kindergarten distribution. The Grade One scores tend to be more concentrated around the mean and less dispersed than the Kindergarten scores. Children in the Kindergarten group typically attain a lower score than the children in the Grade One group. The mean scores are 8.5 for Kindergarten and 11.1 for Grade One. Among Kindergarten children, 29 per cent of those tested attain a total score of 6 or less. In the Grade One group only 3 per cent have total scores of 6 or less. The skill measured by the Perceptual Forms test is a developmental skill and scores are not corrected for age.

In order to select approximately 10 per cent of the children tested, the criterion score for Kindergarten children should be 3 or below; for Grade One children the criterion score should be 7 or below.

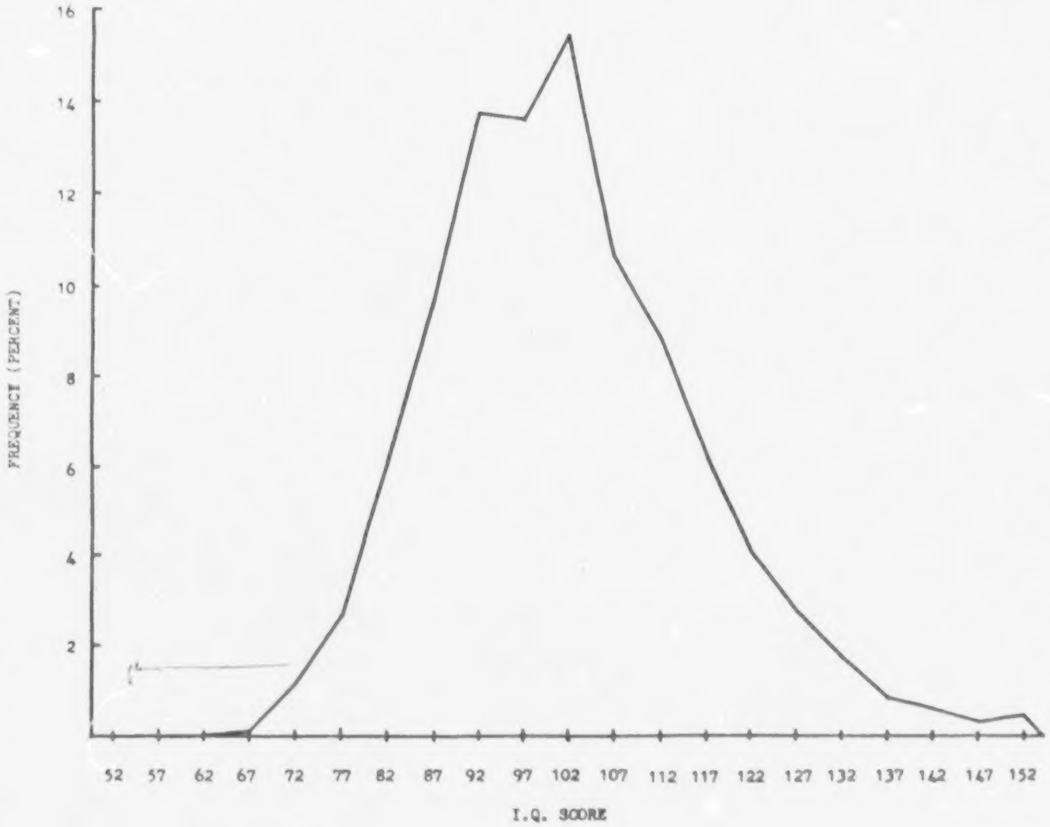


Fig. 6. Frequency distribution of *D.A.P.* I.Q. Scores. The *D.A.P.* was administered in the Fall in Grade One, N = 4247.

BEST COPY AVAILABLE

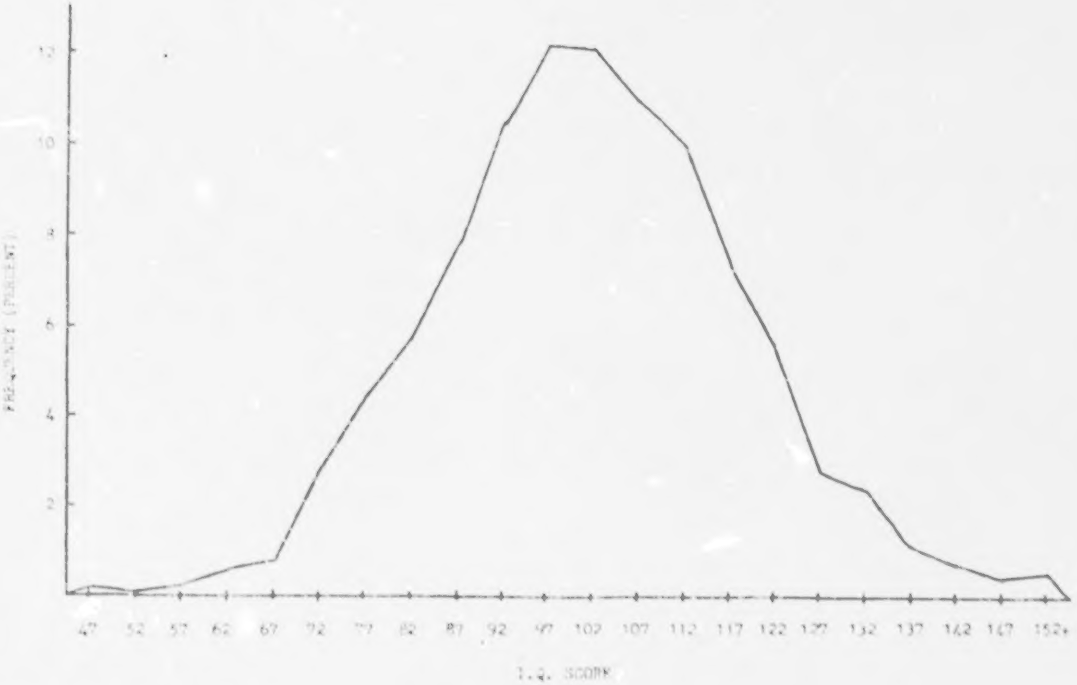


Fig. 7. Frequency distribution of D.A.P. I.Q. Scores. The D.A.P. was administered in the Spring in Kindergarten, N = 2864.

The highest score portions of the distributions differ very little for the two groups. For each group approximately 1 per cent of the children tested attain a score of 18 or above. The one year age difference, therefore, makes little difference in the shape of the distributions among the highest scores.

Not only do children typically attain higher scores in Grade One, thus increasing the mean, but the shape of the distribution differs as well. Most of the change in shape can be accounted for among the lowest scoring 20 per cent. Because of the qualitative and quantitative changes between the distributions, the low scores of Kindergarten children should be interpreted with caution. See Figures 8 and 9.

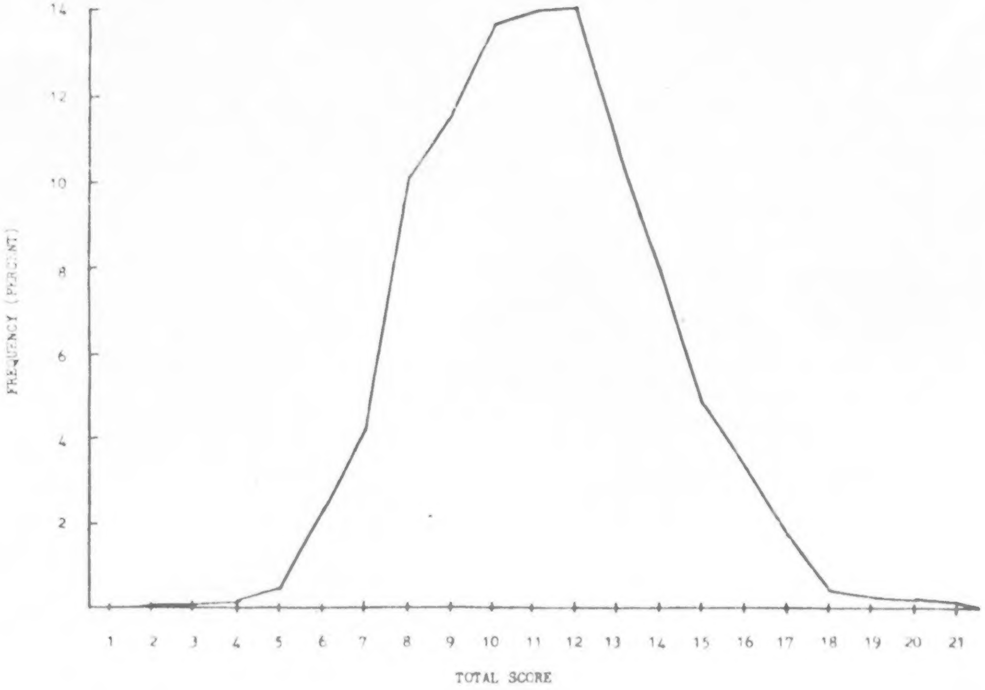


Fig. 8. Frequency distribution of Perceptual Forms Total Scores. The Perceptual Forms was administered in the Fall in Grade One, N = 4770.

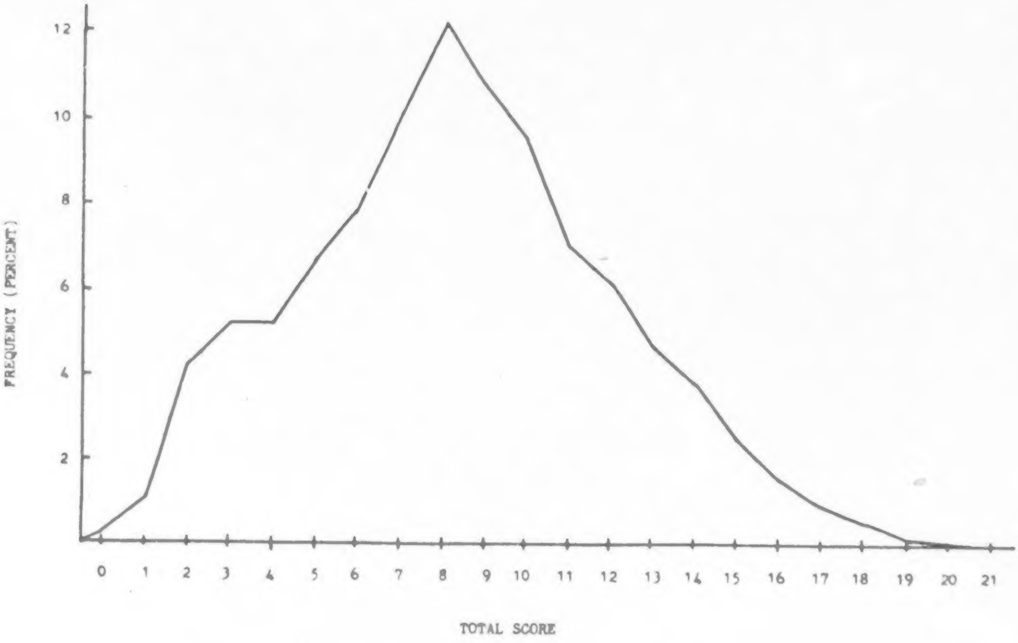


Fig. 9. Frequency distribution of Perceptual Forms Total Scores. The Perceptual Forms was administered in the Spring in Kindergarten, N = 1868.

Kirk XO Test

The *Kirk XO Test* (Kirk) is a paper-pencil test for Kindergarten or Grade One children. The test is composed of five tasks which involve the reproduction of various patterns of X's and O's. The complete test may be administered to a group of children in 15 - 20 minutes.

Each of the five XO patterns is placed on the blackboard in turn. After five seconds the figure is erased and the children are asked to reproduce as many of the figures as they can within the thirty second time limit. See Appendix B for administration and scoring standards.

The *Kirk XO Test* was designed to assess: visual-motor speed and control, spatial organization of perception, sequencing and visual memory. By measuring the basic perceptual-motor functioning underlying school achievement the author hoped to develop a test which would be predictive of school success and failure. In the standardization studies the author of the test found significant correlations between the *XO Test* and: *Wechsler* I.Q., *Henmon-Nelson* I.Q., *Goodenough-Harris* I.Q., *Delacato Tests of Neurological Organization*, *Wepman Auditory Discrimination Test*, writing own name, and *Teacher's Behaviour Rating*. Significant relationships were also found with achievement tests in reading and arithmetic and passing or failing Grade One.

The Kirk XO Test was administered to Grade One children in each of three years. The three samples consisted of 21, 4 and 38 schools. Two schools were in two of the samples; a total of 61 schools and 5,758 children were involved in these samples.

The frequency distributions of total scores for each sample independently and for the three samples combined approach the shape of the normal curve.

Administration and scoring in these three samples followed the standards established by Kirk rather than the revised standards developed through E.I.D.P. which are discussed in Appendix B. The most noticeable difference in the scoring systems is that with Kirk's standards the minimum score is 5 and with E.I.D.P. standards the minimum score is zero.

For the three samples combined (N = 5758), the Quantity scores range from 5 to 95. The mean is 34 and the standard deviation is 14. The Quality scores range from 5 to 39. The mean is 18 and the standard deviation is 5. Both distributions are slightly positively skewed.

The frequency distributions for one of these three samples is presented graphically in Figures 10 and 11 (N = 3881).

Distributions were made for each of 38 schools in one sample. Separate distributions were obtained for the inner-city and non-inner-city schools. The inner-city schools as a group had a lower mean score than the non-inner-city schools. This difference was not statistically significant. Analysis of the distributions for individual schools, however, reveals significant differences. These inter-school differences are apparent in the distribution of school means and the distributions of the scores below which the lowest 5% of scores in each school fall. The mean score for one school is within 2 points of the lowest 5% for another school on the Quantity Scale. The mean score for one school overlaps the lowest 5% of another school on the Quality Scale. See Figures 12 and 13. See Table 10 for data for whole sample.

The *Kirk XO Test* was administered to Kindergarten children in a total of 51 schools during a period of three years. The three samples consisted of 12, 34 and 20 schools. A total of 3,254 children were involved.

The first of these three samples employed the administration and scoring standards developed by Kirk, the latter two

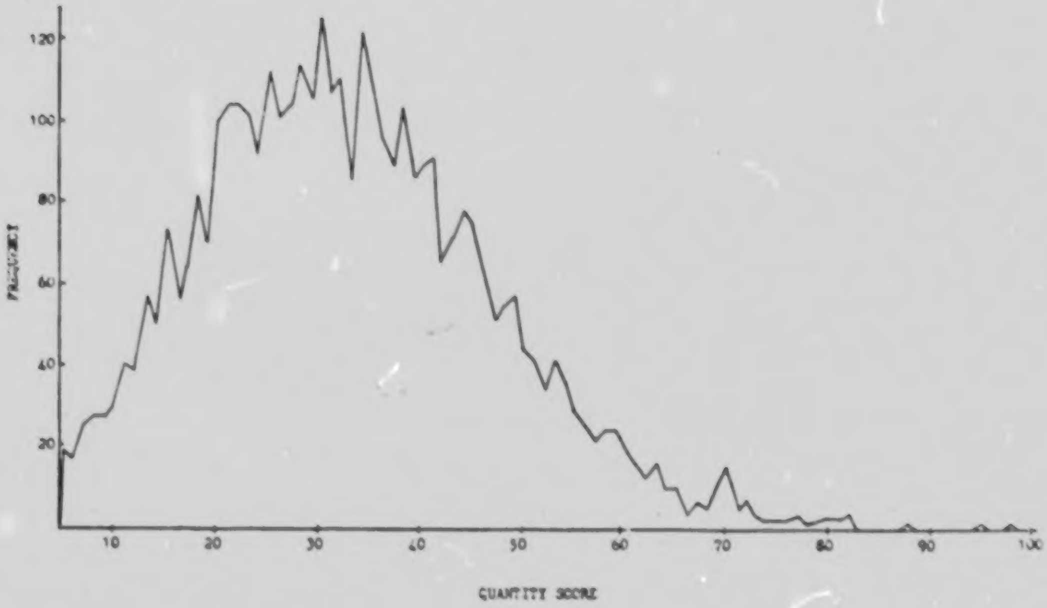


Fig. 10. Frequency distribution of XO Quantity Scores. The XO was administered in the Fall in Grade One, N = 3881. Kirk administration and scoring standards were used.

BEST COPY AVAILABLE

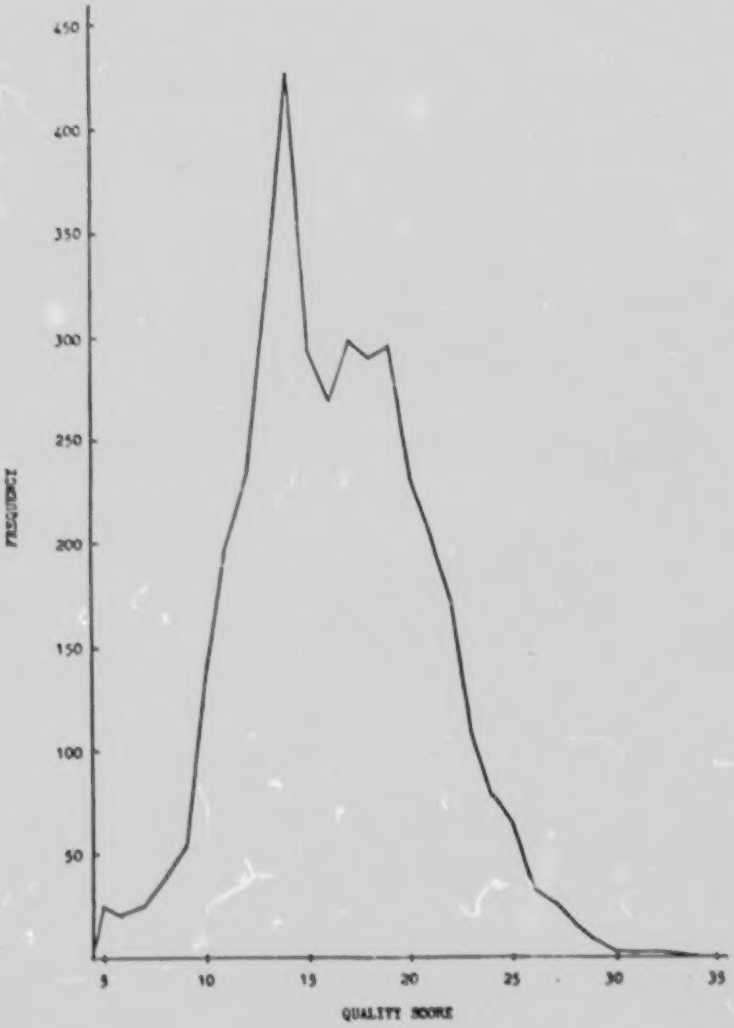


Fig. 11. Frequency distribution of XO Quality Scores. The XO was administered in the Fall in Grade One, N = 3881. Kirk administration and scoring standards were used.

BEST COPY AVAILABLE

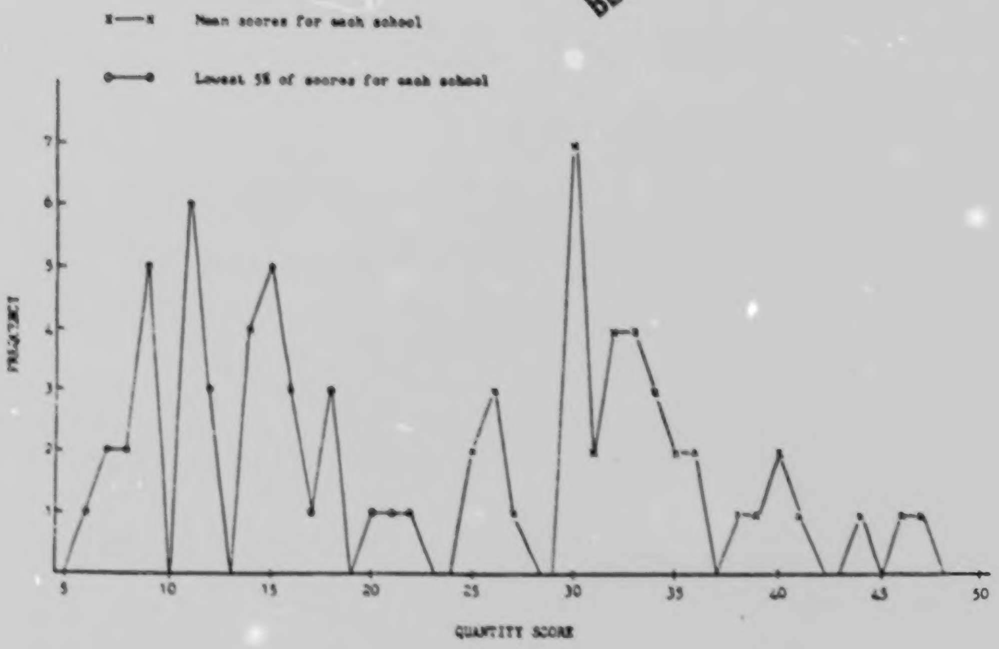


Fig. 12. Frequency distribution of XO Quantity Score means and lowest 5 per cent criterion score in each of 38 schools. The XO was administered in the Fall in Grade One, N = 38 schools. Kirk administration and scoring standards were used.

BEST COPY AVAILABLE

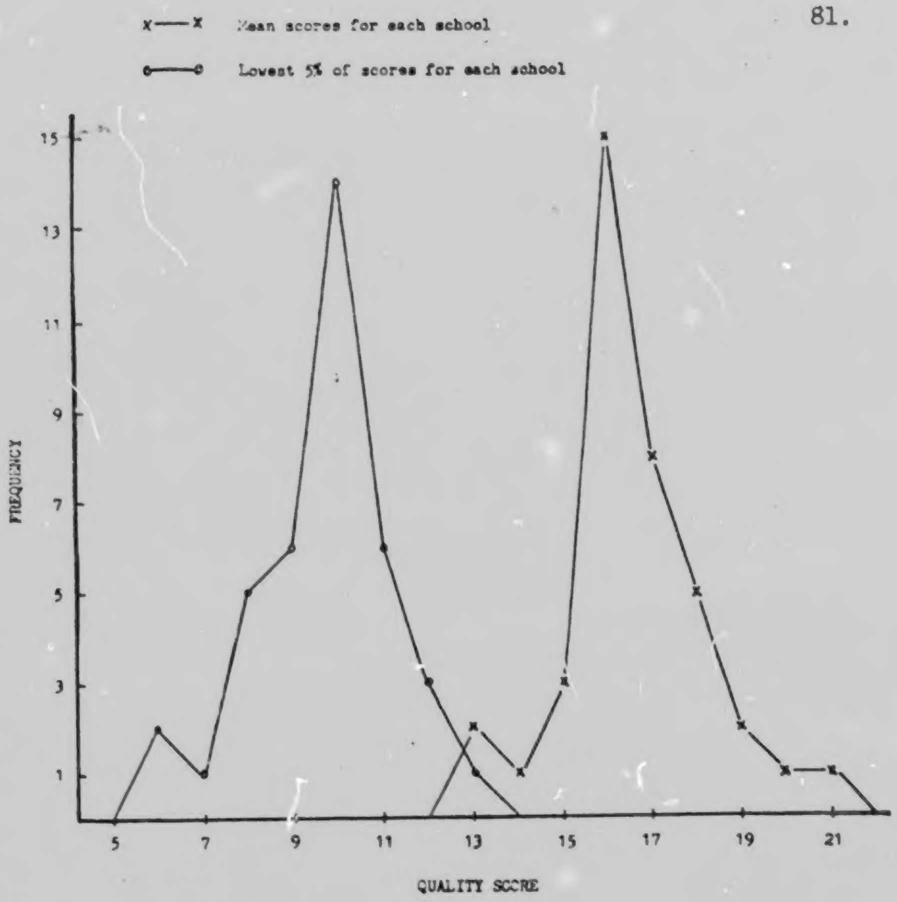


Fig. 13. Frequency distribution of XO Quality Score means and lowest 5 per cent criterion score in each of 38 schools. The XO was administered in the Fall in Grade One, N = 38 schools. Kirk administration and scoring standards were used.

TABLE 10

XO GRADE ONE

N. MEAN, STANDARD DEVIATION AND RANGE

Quantity Score*

N	Mean	S.D.
5758	34	14

Quality Score*

N	Mean	S.D.
5758	18	5

Range of Scores

Quantity	Quality
5 - 95	5 - 39

* Kirk administration and scoring standards

samples employed E.I.D.P. standards. The distributions for the latter two samples combined (N = 2160), approach the shape of the normal curve. Quantity scores range from 0 to 92 and have a mean of 20. The Quality scores range from 0 to 32 and have a mean of 12. See Figures 14 and 15.

The Ns, means and standard deviations for the latter two samples are presented in Table 11.

Depending upon the particular XO criterion scores which are chosen, varying numbers of students will be selected. Different criterion scores yield groups of students which differ in terms of their end of year achievement. Tables 12 and 13 present data for Grade One screening in which the achievement of groups generated by different criterion scores are compared.

XO Validity

In order to compare XO test performance with later school progress, a subgroup was chosen for particular study. This consisted in the first place of 90 children, 45 in Kindergarten and 45 in Grade One. Fifteen were randomly selected from the highest 5% of scores, fifteen from the lowest 5% of scores and fifteen from those attaining a mean score at each grade level.

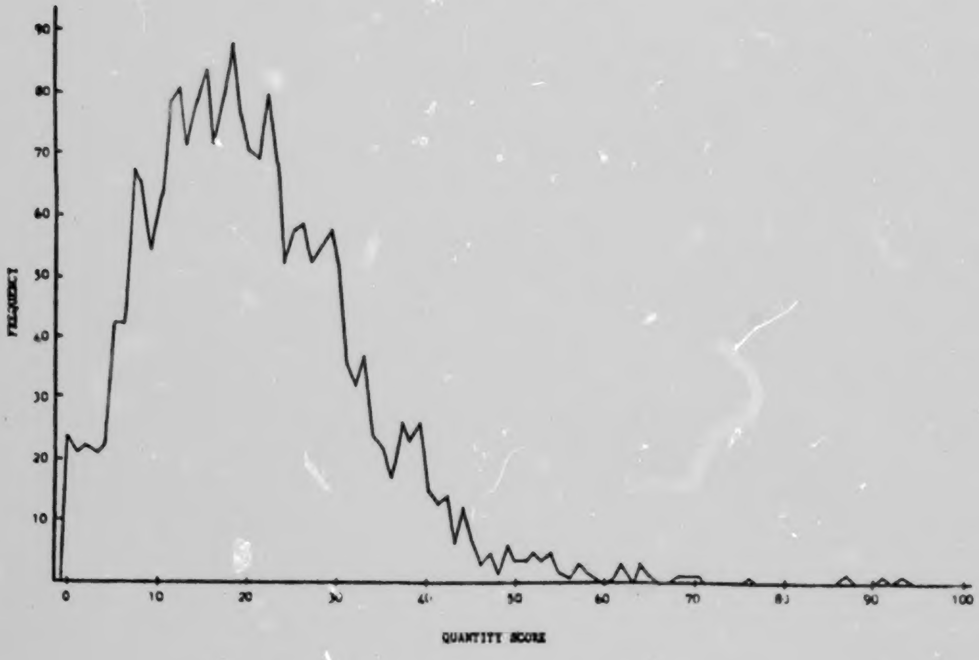


Fig. 14. Frequency distribution of XO Quantity Scores.
The XO was administered in the Spring in Kindergarten, N = 2160.
E.I.D.P. administration and scoring standards were used.

BEST COPY AVAILABLE

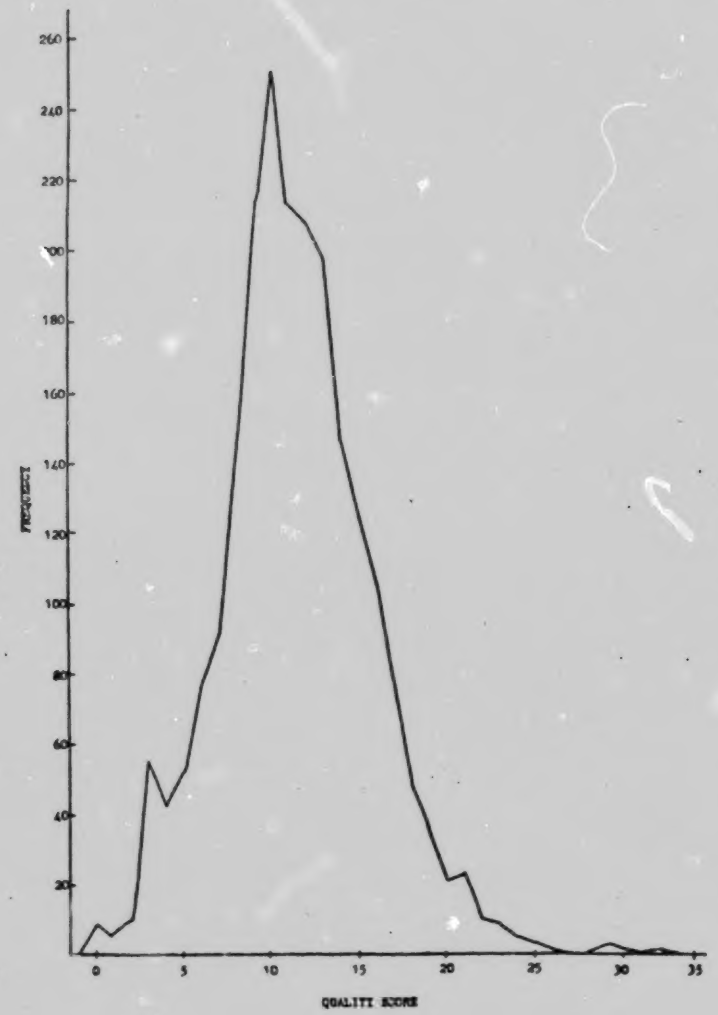


Fig. 15. Frequency distribution of XO Quality Scores. The XO was administered in the Spring in Kindergarten, N = 2160. E.I.D.P. administration and scoring standards were used.

TABLE 11

XO KINDERGARTEN

N. MEAN, STANDARD DEVIATION AND RANGE

Quantity Score *

Sample	N	Mean	S.D.
Sample 1	1546	20	12
Sample 2	614	20	11

Quality Score *

Sample	N	Mean	S.D.
Sample 1	1546	11	4
Sample 2	614	12	4

Range of Scores

Sample	Quantity	Quality
Sample 1	0 - 92	0 - 32
Sample 2	0 - 71	0 - 25

* E.I.D.P. administration and scoring systems

TABLE 12

END OF GRADE ONE LEVEL OF INSTRUCTION IN READING FOR GROUPS SELECTED BY VARIOUS XO QUANTITY SCALE CRITERION SCORES AND FOR GROUPS UNSELECTED BY THE XO QUANTITY SCALE CRITERION SCORES.

SELECTED GROUPS

Of those groups selected by various criterion scores, the percentages at these Levels of Instruction in Reading are:

Level of Instruction in Reading	XO Quantity Criterion Scores				
	5	10	15	20	25
Chart Reading and below	71%	56%	45%	37%	27%
Pre-Primer and below	94	91	81	73	65
Pre-Primer and above	29	44	55	63	73
Primer and above	6	9	19	27	35

UNSELECTED GROUPS

Of those at the Chart Reading or Pre-Primer level, the percentages not selected by the criterion scores are:

Level of Instruction in Reading	XO Quantity Criterion Scores				
	5	10	15	20	25
Chart Reading and below	97%	82%	61%	41%	27%
Pre-Primer and below	99	91	78	63	45

TABLE 13

END OF GRADE ONE LEVEL OF INSTRUCTION IN READING FOR GROUPS SELECTED BY VARIOUS XO QUALITY SCALE CRITERION SCORES AND FOR GROUPS UNSELECTED BY THE XO QUALITY SCALE CRITERION SCORES.

SELECTED GROUPS

Of those groups selected by various criterion scores, the percentages at these Levels of Instruction in Reading are:

Level of Instruction in Reading	XO Quality Criterion Scores				
	5	7	9	11	13
Chart Reading and below	62%	60%	47%	37%	31%
Pre-Primer and below	91	90	82	70	70
Pre-Primer and above	38	40	52	62	71
Primer and above	8	10	17	29	35

UNSELECTED GROUPS

Of those at the Chart Reading or Pre-Primer level and below, the percentages not selected by the criterion scores are:

Level of Instruction in Reading	XO Quality Criterion Scores				
	5	7	9	11	13
Chart Reading and below	96%	90%	82%	58%	34%
Pre-Primer and below	98	95	91	76	56

In a pilot study Kirk had observed that children making a bizarre Quality score on the X task (subtest 1) often failed in school despite adequate overall IQ test performance, and that their teachers often perceived them as emotionally disturbed. About 1% of children produce bizarre patterns. In the survey 15 Grade One children and 17 Kindergarten children produced a bizarre pattern. These constituted a fourth group for inclusion in the study, making a total of 132 subjects altogether.

For all except four of the children, it was possible to trace school progress and adjustment in terms of grade placement at the end of four years, the amount of additional or specialized educational services required, and the referrals made by the teacher or principal to psychological services when a child was functioning inadequately in school.

At the end of four years, whether the IQ was administered in Kindergarten or in Grade One, all of the high scorers were in their expected grade without requiring extra help, a higher percentage of the Mid group than the Low group achieved this level. Similarly, a higher proportion of the Low group than the Mid group required special education or an extra year in the Primary Division. See Tables 14 and 15.

TABLE 14

GRADE PLACEMENT FOUR YEARS AFTER XO ADMINISTRATION IN GRADE I

Grade Placement	XO Group			
	High Score on XO	Mid Score on XO	Low Score on XO	Bizarre Score on XO
Grade V	14 (100%)	13 (86.67%)	2 (13.33%)	10 (66.67%)
Grade V with extra help	0	1 (6.67%)	2 (13.33%)	1 (6.67%)
Grade IV	0	1 (6.67%)	8 (53.33%)	1 (6.67%)
Behavioural Class and/or Residential	0	0	2 (13.33%)	2 (13.33%)
Special Program Primary or Junior	0	0	1 (6.67%)	1 (6.67%)
Total	14	15	15	15
Not traced	1	0	0	0

TABLE 15

GRADE PLACEMENT FOUR YEARS
AFTER XO ADMINISTRATION IN KINDERGARTEN

Grade Placement	XO Group			
	High Score on XO	Mid Score on XO	Low Score on XO	Bizarre Score on XO
Grade IV	15 (100%)	6 (50.00%)	6 (40.00%)	8 (47.06%)
Grade IV with extra help	0	3 (25.00%)	3 (20.00%)	2 (11.76%)
Grade III	0	2 (16.67%)	2 (13.33%)	3 (17.64%)
Behavioural Class and/or Residential	0	1 (8.33%)	1 (6.67%)	4 (23.53%)
Special Program Primary or Junior	0	0	3 (20.00%)	0
Total	15	12	15	17
Not traced	0	3	0	0

In Tables 14 and 15 the grade placements at the end of four years for children screened in Kindergarten and in Grade One are shown separately. The difference between the Mid group and the Low group is less pronounced in the Kindergarten administration.

The need for psychological referrals indicating difficulties in socioemotional and academic functioning increases as we move from the High to the Mid to the Low groups. See Tables 16 and 17.

In the group of thirty-two children who had bizarre orientation scores were children who, in spite of the unusual arrangement on the page, obtained scores which were not significantly different from the scores of other children.

The bizarre scorers, although using unusual arrangements of figures on the page and achieving somewhat lower *XO* scores, had a mean I.Q. of 100.4 and a range of intelligence (as measured by *W.I.S.C.* scores) from 60 to 130. This is comparable to the sample of 90 children (High, Mid and Low combined) whose mean intelligence quotient was 103.2 with a range from 65 to 140.

Several of the children with bizarre scores experienced academic difficulty as revealed by grade placement and the need for additional educational services. Only 66% were at the ex-

TABLE 16

STUDENTS REFERRED TO PSYCHOLOGICAL SERVICES IN FOUR YEARS FOLLOWING ADMINISTRATION OF XO IN GRADE I

Referred	XO Group			
	High XO Score	Mid XO Score	Low XO Score	Bizarre XO Score
Referred	1 (7.14)	2 (13.33)	13 (86.66)	5 (33,33)
Not Referred	13 (92.85)	13 (86.66)	2 (13.33)	10 (66.66)
Total	14	15	15	15
Not traced	1	0	0	0

TABLE 17

STUDENTS REFERRED TO PSYCHOLOGICAL SERVICES IN FOUR YEARS FOLLOWING ADMINISTRATION OF XO IN KINDERGARTEN

Referred	XO Group			
	High XO Score	Mid XO Score	Low XO Score	Bizarre Score
Referred	1 (6.66)	6 (50.00)	9 (60.00)	10 (58.82)
Not referred	14 (93.33)	6 (50.00)	6 (40.00)	7 (41.18)
Total	15	12	15	17
Not traced	0	3	0	0

pected grade level compared with 76% of the rest of the sample. See Table 18.

The later emotional adjustment of the group with bizarre XO scores is of particular interest in view of the possibility that bizarre orientation scores might be an indication of potential difficulty in the emotional area. Of the bizarre group 18.8% experienced adjustment difficulties leading to psychiatric consultation and/or placement in behavioural class or residential treatment centres compared to 4.6% in the rest of the sample. In other words, of the 10 children from the combined High, Mid, Low and Bizarre groups having relatively serious emotional problems during the four years, six were identifiable in Kindergarten and Grade One by a bizarre orientation score. It should be kept in mind that neither the E.I.D.P. staff member nor the school staff had any information concerning these scores, so that there was no danger that a factor of self-fulfilling prophecy would influence the course of events.

It would seem that the bizarre score is an important early indicator of a need for second level screening to enable the school to sort out those children who require extra support and specialized educational resources if they are to manage to achieve adequately in school.

TABLE 18

LATER GRADE PLACEMENT OF CHILDREN WITH BIZARRE AND NON-BIZARRE SCORES ON XO TESTS ADMINISTERED IN KINDERGARTEN OR IN GRADE I

Grade Placement	XO Group	
	High, Mid, Low	Bizarre
In expected grade level	56 (65.1%)	18 (56.3%)
In expected grade level with extra help	9 (10.5%)	3 (9.4%)
One grade below expected level	13 (15.1%)	4 (12.5%)
Special Program Junior	4 (4.6%)	1 (3.1%)
Behavioural Class or Residential treatment	4 (4.6%)	6 (18.8%)
Total	86	32
Not traced	4	0

Low, Mid, High XO Scoring Groups

The reading achievement of children with Low, Mid and High *XO* scores may be seen in Tables 19 and 20. In every case, when the *XO* was administered in Kindergarten or in Grade One, and when reading achievement was assessed at the end of Grades One, Two and Three, the groups with the highest *XO* scores had the highest level of reading achievement and the groups with the lowest *XO* scores had the lowest level of reading achievement. In four of five comparisons the Low *XO* groups had statistically significantly lower levels of reading achievement than the groups with Mid *XO* scores. The Mid and High score groups are similarly significantly different in three of five comparisons. Children with bizarre scores tended to have levels of reading achievement near those of the groups with Mid *XO* scores. See Tables 19 and 20.

Tables 21, 22, 23 and 24 present means and t tests for the *XO* Low, Mid and High scoring groups in terms of individually administered tests (*W.I.S.C.*/*W.I.P.P.S.I.*, *Bender Gestalt*, *Reproduction of Rhythm* - *Ontario School Abilities Examination*, and *Wepman Auditory Discrimination Test*). With one exception (*Auditory Discrimination Test Y scale*), the High *XO* group obtained better scores than the Low *XO* group. In terms of selec-

TABLE 19

MEANS FOR LOW, MID, HIGH AND BIZARRE GRADE ONE XO GROUPS IN TERMS OF LEVEL OF INSTRUCTION IN READING AT THE END OF GRADES ONE, TWO, AND THREE.

t TESTS FOR LOW-MID AND MID-HIGH.

Level of Instruction in Reading at end of:	XO Group							
	High		Mid		Low		Bizarre	
	N	Mean	N	Mean	N	Mean	N	Mean
Grade I	11	6.2	12	4.9	13	1.9	12	3.6
Grade II	11	7.8	7	7.7	6	3.3	8	5.5
Grade III	10	10.0	5	9.8	4	6.8	6	8.8

t tests of differences between Means

Level of Instruction in Reading at end of:	Low - Mid		Mid - High	
	t	p	t	p
Grade I	6.14	.001	2.33	.05
Grade II	4.76	.001	0.32	ns
Grade III	2.58	.05	0.27	ns

TABLE 20

MEANS FOR LOW, MID, HIGH AND BIZARRE KINDERGARTEN XO GROUPS IN TERMS OF LEVEL OF INSTRUCTION IN READING AT THE END OF GRADES ONE AND TWO.

t TESTS FOR LOW - MID AND MID - HIGH

Level of Instruction in Reading at end of:	XO Group							
	High		Mid		Low		Bizarre	
	N	Mean	N	Mean	N	Mean	N	Mean
Grade I	12	6.1	7	3.6	7	2.1	11	3.6
Grade II	11	8.6	6	6.5	4	5.0	7	6.4

t tests of differences between Means

Level of Instruction in Reading at end of:	Low - Mid		Mid - High	
	t	p	t	p
Grade I	2.27	.05	4.56	.001
Grade II	0.76	ns	3.40	.01

TABLE 21

MEANS FOR LOW, MID AND HIGH GRADE ONE XO GROUPS ON INDIVIDUALLY ADMINISTERED TESTS

Individually Administered tests	XO Group Means		
	High (N=13)	Mid (N=29)	Low (N=16)
W.I.S.C.			
Verbal I.Q.	111.33	108.00	87.14
Performance I. Q.	119.44	109.45	84.42
Full Scale I.Q.	116.86	106.60	84.28
Bender Gestalt (errors)	2.44	5.19	10.14
Reproduction of Rhythm, O.S.A.(errors)	7.62	10.29	13.18
Wepman, Auditory Discrimination (errors)			
X	3.54	7.36	9.47
Y	0.31	0.43	1.60

TABLE 22

t TESTS FOR LOW, MID AND HIGH GRADE ONE XO GROUPS IN TERMS OF INDIVIDUALLY ADMINISTERED TESTS

Individually Administered Tests	t Tests Between XO Groups					
	High-Mid		High-Low		Mid-Low	
	t	p	t	p	t	p
W.I.S.C.						
Verbal I.Q.	0.50	ns	3.69	.01	3.46	.01
Performance I.Q.	1.57	ns	7.28	.001	4.45	.001
Full Scale I.Q.	1.49	ns	5.98	.001	4.55	.001
Bender Gestalt (errors)	2.50	.02	6.36	.001	4.90	.001
Reproduction of Rhythm, O.S.A. (errors)	2.41	.05	4.92	.001	2.65	.02
Wepman, Auditory Discrimination (errors)						
X	2.26	.05	3.75	.001	1.17	ns
Y	0.60	ns	2.43	.05	3.00	.01

TABLE 23

MEANS FOR LOW, MID AND HIGH KINDERGARTEN IQ GROUPS ON INDIVIDUALLY ADMINISTERED TESTS

Individually Administered Tests	IQ Group Means		
	High N=15	Mid N=26	Low N=17
WPPSI			
Verbal I.Q.	121.33	98.15	86.88
Performance I.Q.	122.87	100.08	84.59
Full Scale I.Q.	124.27	98.77	84.59
Reproduction of Rhythm, O.S.A. (errors)	9.60	13.08	16.81
Wepman, Auditory Discrimination (errors)			
X	2.53	7.48	10.41
Y	1.13	0.88	3.36

TABLE 24

t TESTS FOR LOW, MID AND HIGH KINDERGARTEN XO GROUPS IN TERMS OF INDIVIDUALLY ADMINISTERED TESTS

Individually Administered Tests	t Tests Between XO Groups					
	High-Mid		High-Low		Mid-Low	
	t	p<	t	p<	t	p<
WPPSI						
Verbal I.Q.	5.99	.001	6.51	.001	2.97	.01
Performance I.Q.	5.40	.001	8.39	.001	3.47	.001
Full Scale I.Q.	7.84	.001	8.20	.001	3.20	.01
Reproduction of Rhythm, O.S.A. (errors)	3.55	.001	6.55	.001	4.05	.001
Wepman, Auditory Discrimination (errors)						
X	3.37	.01	4.53	.001	1.87	ns
Y	0.63	ns	2.79	.01	3.70	.001

tion criteria it should be noted that the *Mid* and *Low IQ* groups are significantly different on six of seven individual test scales for Grade One students and on five of six individual test scales for Kindergarten.

Criteria

Level of Instruction in Reading Distributions

The Level of Instruction in Reading measure is derived from ratings made by teachers during the last month of the school year. These measures are representative of the reading activity of children at the end of Grade One, Two, or Three. The ratings are of the level at which instruction is taking place. Reading achievement as such may be at or above or below the instructional level. Teacher ratings probably provide the best single estimate of the ongoing work in the classroom.

An estimate of the test-retest reliability of the *Teacher Rating Chart* was obtained in two schools. In one school (22% English not first language, 11% lower socioeconomic group), seven teachers of Grades One through Four completed a second set of *Teacher Rating Charts* one month after the first set was completed. The teachers did not expect to be asked to complete the charts again and they did not keep a record of their previous ratings. Pearson product moment correlations were obtained for each item on the Chart. The correlation coefficient for the Level of Instruction in Reading item was r = .972. In another school (13% English not first language, 74% lower socioeconomic group), three Grade One teachers similarly recompleted the Teacher Rating Charts. The correlation coefficient for Level of Instruction in Reading was r = .877. See Appendix E for the correlations obtained on other items of the Teacher Rating Chart.

The Level of Instruction in Reading distributions for Grade One children measured at the end of Grade One is approximately normal in shape. The distribution departs from normality in that there are a disproportionately large number of children receiving instruction at the Readiness level. Over 50 per cent of Grade One children received no instruction beyond the Primer level during their Grade One year. Nearly 30 per cent received no instruction beyond the Pre-primer level. Less than 8 per cent received instruction in levels beyond Book I. As a whole the distribution for Grade One children is displaced towards the low end of the scale. See Figure 16 and Page 40.

The distribution for Grade Two children is not normal in form but is markedly skewed. By the end of Grade Two more children were being instructed in Book IIb than at any other level.

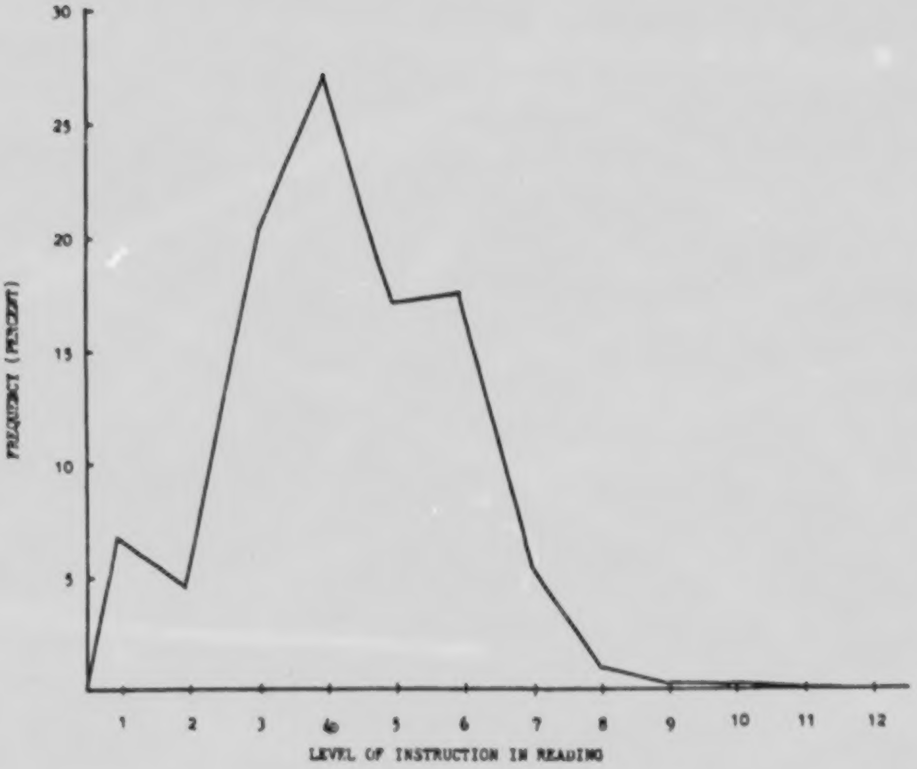


Fig. 16. Frequency distribution of Level of Instruction in Reading: Grade One. The rating of the Level of Instruction in Reading was obtained in the last month of Grade One, N = 17,883.

However, most children were receiving instruction in Book IIa or at a lower level. There were some children working in the Book III level or beyond, but there were more children at the Primer level or below. See Figure 17.

The distribution for the end of Grade Three children is similar in shape to the Grade Two distribution but is even more skewed. Thirty per cent of the Grade Three children were being instruction in Book IIIb at the end of Grade Three year. Most children, however, were working in the early part of Book IIIa or below. Seventeen per cent were being instructed in the Book IV level or above. Thirty-six per cent were being instructed below the Book IIIa level. See Figure 18.

In the transition from Grade One to Grade Three Level of Instruction in Reading a noticeable shift in reading instruction level occurs. As a whole, the distribution moves upward. The median moves from Primer to Book IIa to Book IIIa.

In Grades Two and Three there is a very wide range of instruction offered. In Grade Three, for instance, a classroom typical of this distribution could include some children being instructed in Primer level or below and other children being instructed at a level beyond Book IV.

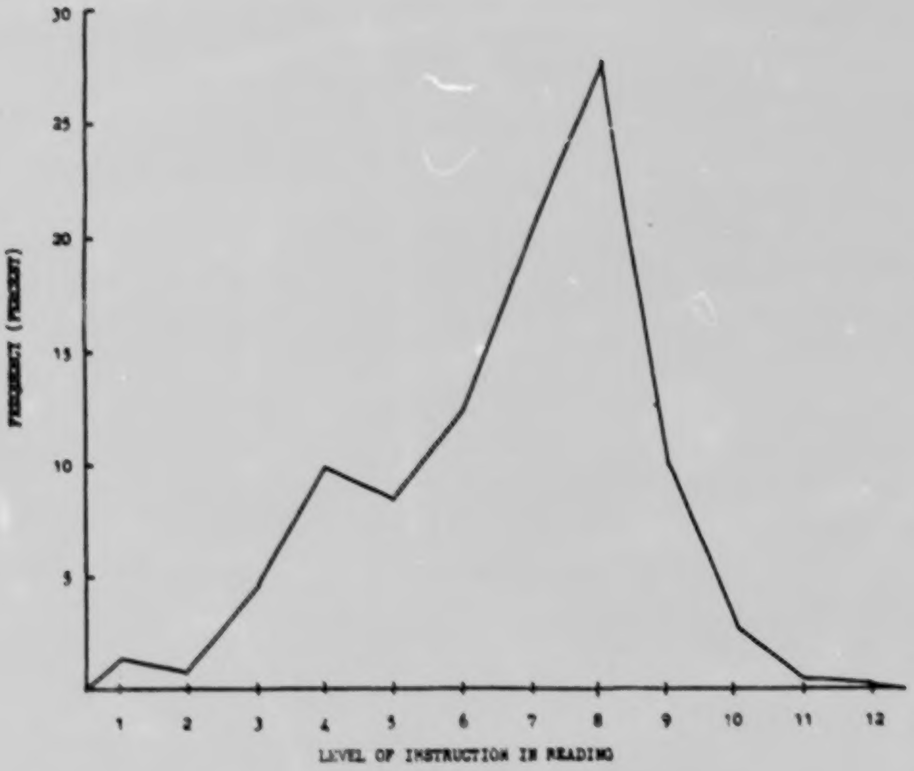


Fig. 17. Frequency distribution of Level of Instruction in Reading: Grade Two. The rating of the Level of Instruction in Reading was obtained in the last month of Grade Two, N = 7847.

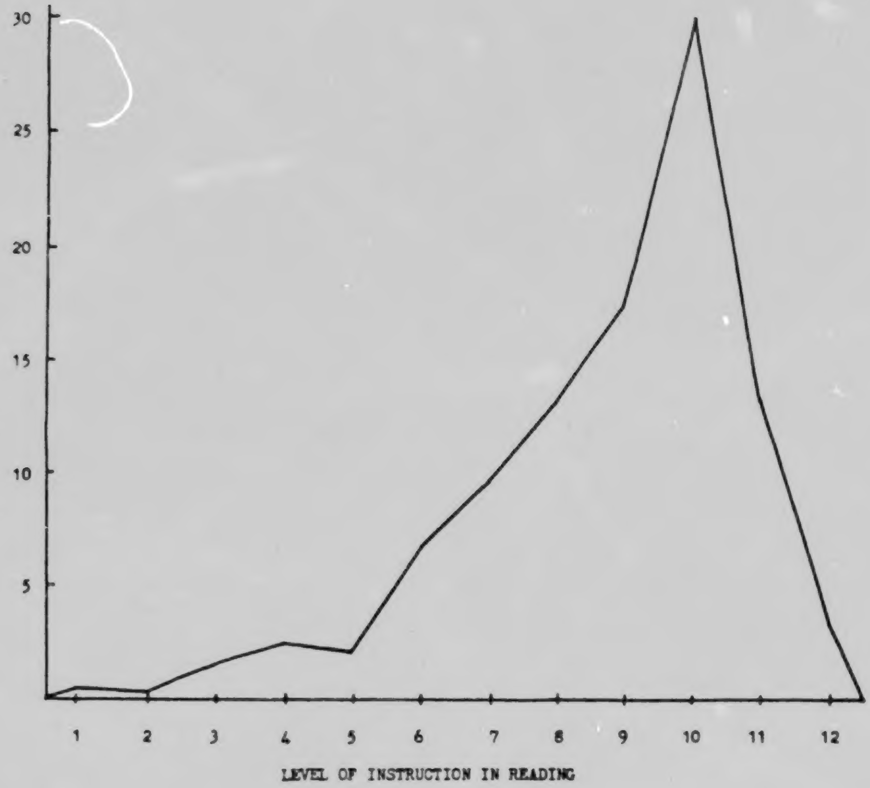


Fig. 18. Frequency distribution of Level of Instruction in Reading: Grade Three. The rating of the Level of Instruction in Reading was obtained in the last month of Grade Three, N = 2689.

Gates-MacGinitie Reading Tests Distributions

Gates-MacGinitie Reading Tests were administered during the last six weeks of the school year in Grades One, Two, or Three. The Grade Scores derived from the raw scores are indicative of grade standing as based on the norms for the test.

In the following graphs, Grade Scores are combined into first five months and last five months of the school year to provide more convenient comparison with Teacher Rating Chart distributions.

Grade Scores are somewhat difficult to interpret since the units in the scale are not equal to each other. Differences between months near the low end of the scale represent larger differences than between months near the high end of the scale.

The schools included in the Gates administration are representative of the city as a whole. Twenty-seven schools are included in the Grade One Gates administration, and twenty-four schools are included in the Grade Two Gates administration. In both cases, the schools are well distributed throughout the city. For the Grade Three Gates administration, four schools are included. These four schools are representative of the schools in the city in terms of socioeconomic and language characteristics.

The socioeconomic and linguistic characteristics of these schools were as follows:

School	English not first language	Lower socio-economic group
A	13%	11%
B	13	74
C	39	56
D	55	54

Two of the schools are matched by percentage of children learning English as a second language, but differ greatly in terms of the socioeconomic dimension. Two schools are matched in terms of socioeconomic dimension but differ in terms of percentage of children learning English as second language.

The distributions of Gates-MacGinitie Reading Test scores administered at end of Grade One are very skewed. On the Vocabulary Scale 48% of the children attain scores below mid Grade One level. On Comprehension scales 43% of children attain scores below mid Grade One level. Twenty-four per cent attain scores of Grade 2.0 or above. See Figures 19 and 20.

The distributions of Gates-MacGinitie Reading Tests administered at the end of Grade Two are slightly less skewed than the Grade One tests. On the Vocabulary scale, 46 per cent, and on the Comprehension scale 44 per cent of the children score below

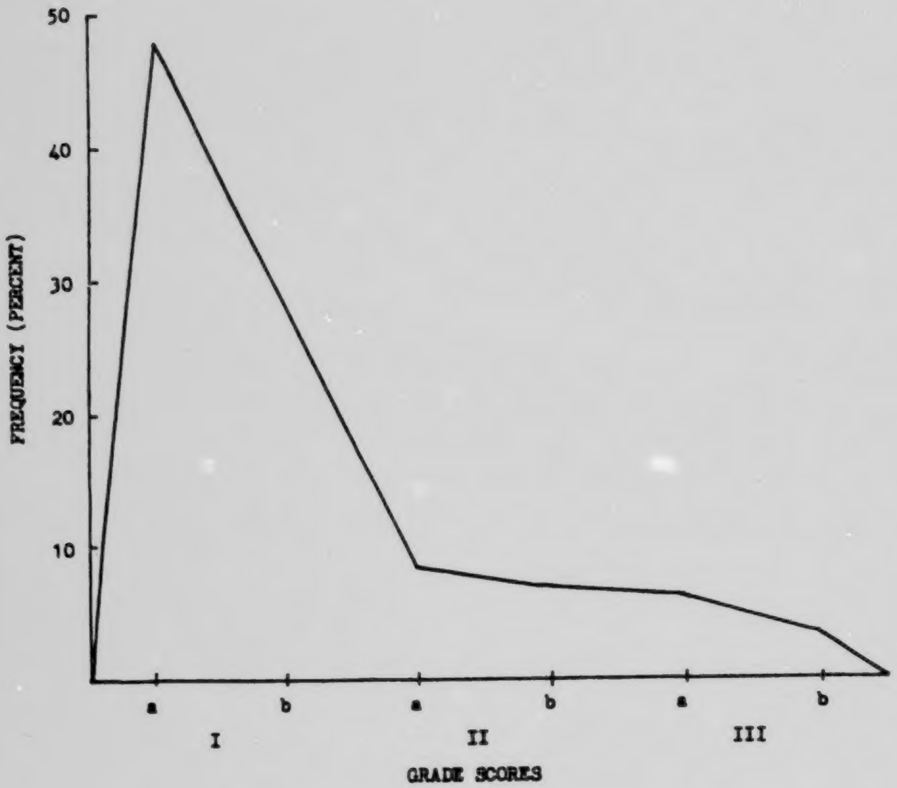


Fig. 19. Frequency distribution of Gates-MacGinitie Reading Test Vocabulary Grade Scores: Grade One. The Gates-MacGinitie Reading Test was administered in the last six weeks of Grade One, N = 2063.

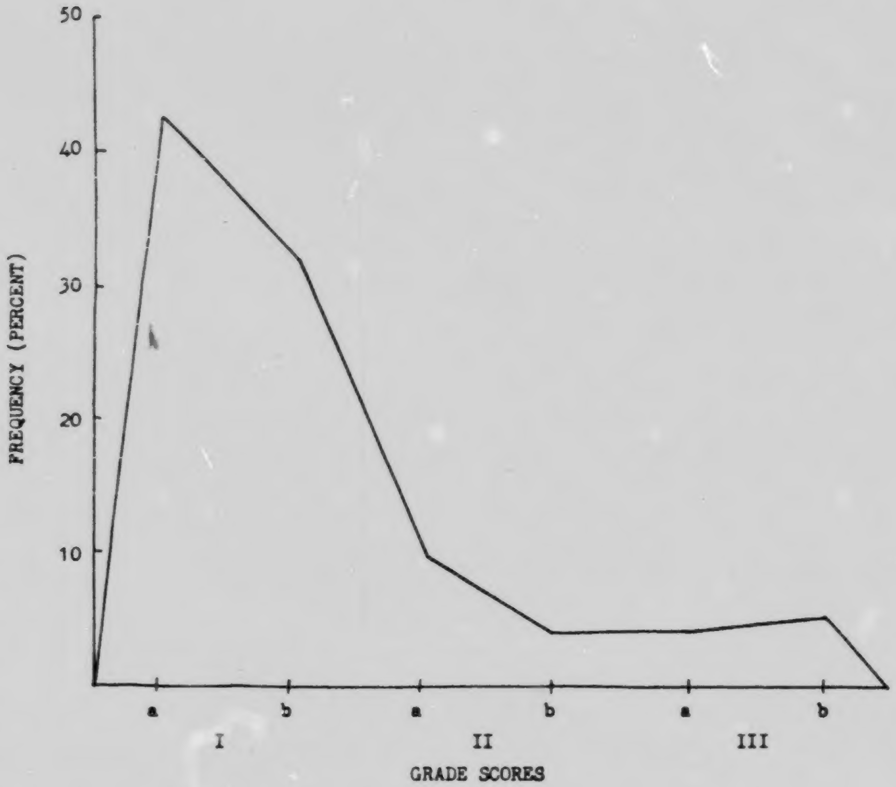


Fig. 20. Frequency distribution of Gates-MacGinitie Reading Test Comprehension Grade Scores: Grade One. The Gates-MacGinitie Reading Test was administered in the last six weeks of Grade One, N = 2089.

the Grade 2.0 level. Slightly over 30 per cent of the children score at the Grade 3.0 level or above on both the Vocabulary and Comprehension scales. See Figures 21 and 22.

The scores of the Gates-MacGinitie administration at the end of Grade Three have a more nearly rectangular shape although there is a slight skew in the direction opposite to that found in the previous two grade levels. There is also evidence of multimodality in the Grade Three distributions. In the Grade Three administration, 40 per cent of the children score at the Grade Two level or below. Forty per cent score at the Grade Four level or above. There are relatively few children scoring in the Grade Three level compared to those scoring at the lower or higher ends of the distribution. See Figures 23 and 24.

The comparison of Gates-MacGinitie scores and Teacher Ratings of Reading Instruction Level reveal differences between the two assessments of reading level.

The end of Grade One rating and test results indicate that there is a considerable discrepancy between the two measures in terms of the children working or scoring at the Grade Two level or above. In the Level of Instruction in Reading rating, 7 per cent of the Grade One children are working at the Grade Two level or above. On both Vocabulary and Comprehension Gates-MacGinitie

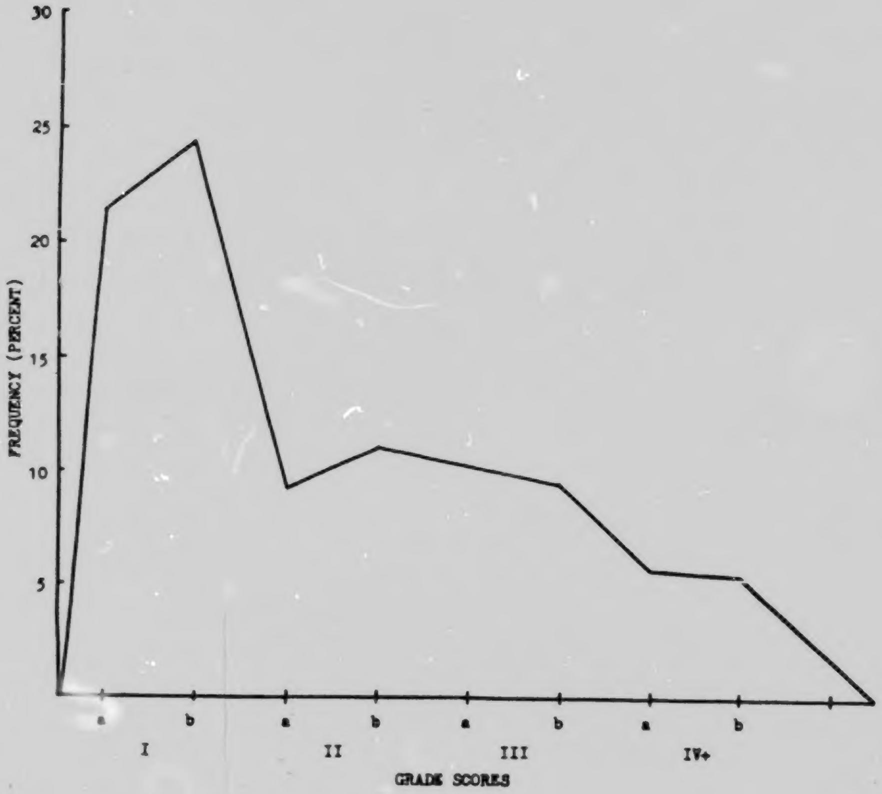


Fig. 21. Frequency distribution of Gates-MacGinitie Reading Test Vocabulary Grade Scores: Grade Two. The Gates-MacGinitie Reading Test was administered in the last six weeks of Grade Two, N = 1634.

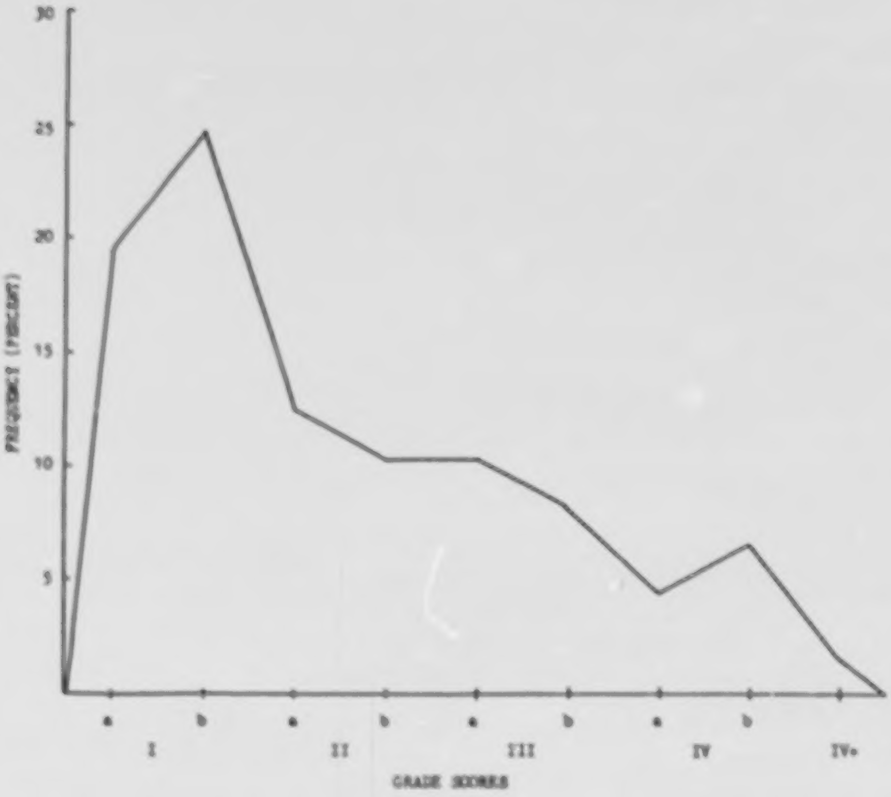


Fig. 22. Frequency distribution of Gates-MacGinitie Reading Test Comprehension Grade Scores: Grade Two. The Gates-MacGinitie Reading Test was administered in the last six weeks of Grade Two, N = 1630.

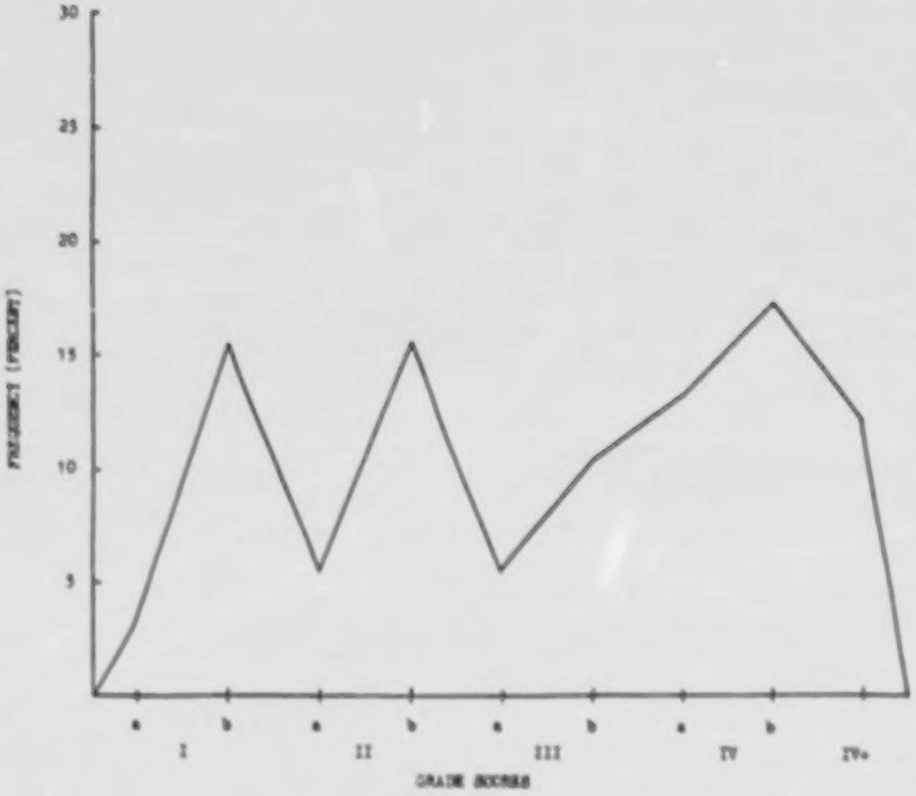


Fig. 23. Frequency distribution of Gates-MacGinitie Reading Test Vocabulary Grade Scores: Grade Three. The Gates-MacGinitie Reading Test was administered in the last six weeks of Grade Three, N = 255.

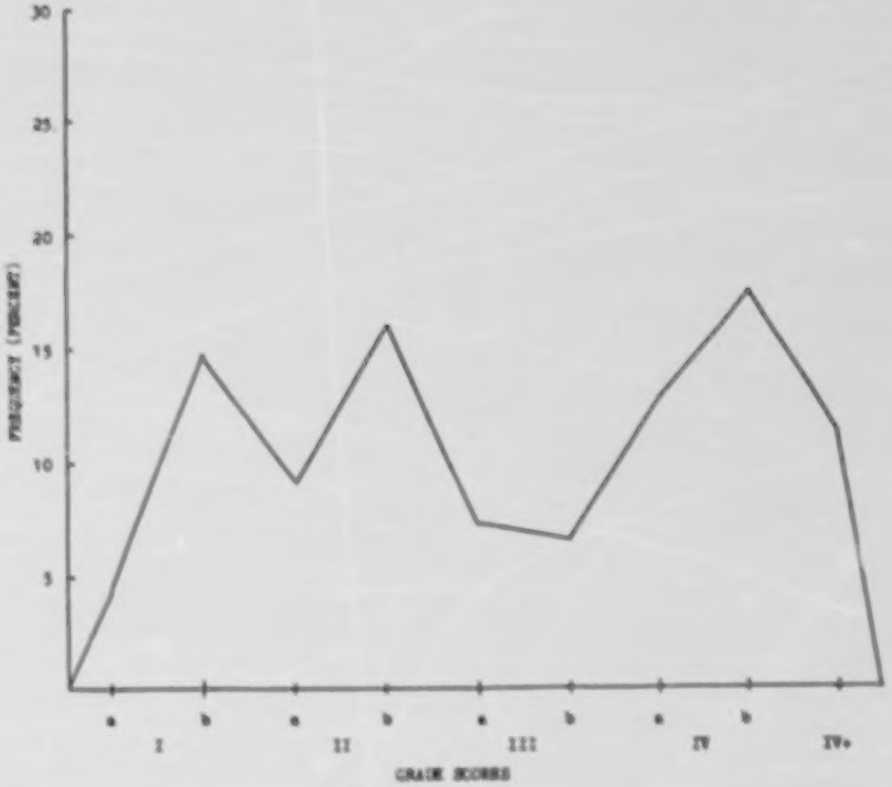


Fig. 24. Frequency distribution of Gates-MacGinitie Reading Test Comprehension Grade Scores: Grade Three. The Gates-MacGinitie Reading Test was administered in the last six weeks of Grade Three, N = 256.

scales, 24 per cent have grade scores of Grade Two or above. There is a difference of 16 per cent between these two measures of reading. According to these results, 16 per cent of the children who have a reading level of Grade Two or above, as measured by Gates-MacGinitie, are receiving instruction below this level.

By the end of Grade Two the comparison of Gates-MacGinitie results and Teacher Rating results indicates that the Gates-MacGinitie scores tend to be relatively more frequent at the low end and high end of the range than are the Level of Instruction ratings. According to the Gates-MacGinitie results, there are more children at the Grade One level, fewer children at the Grade Two level, and more children at the Grade Three level than indicated by the Teacher Rating Level of Instruction in Reading. The differences are about 9 per cent at Grade One and 18 per cent at Grade Three and above.

The tests and ratings at the end of Grade Three reveal differences between the two measures of only about 6 per cent for the children scoring or rated at Grade One or Grade Two levels. However, there are differences of 26 per cent in estimates of children at Grade Four level and above. Gates-MacGinitie results indicate more children at Grade Four or above.

For all three Grades, the Gates-MacGinitie results indicate that there are more children with reading skills below their grade level than is revealed by their Level of Instruction in Reading. There is a more pronounced difference in that the Gates-MacGinitie results indicate that there are more children with reading skills above their grade level than is indicated by their Level of Instruction in Reading.

Instructional level appears to be more focused on the middle skill level groups than would be indicated by the Gates-MacGinitie results. See Table 25.

Since it was the intention of the program to identify high risk children, the Teacher Rating Chart was the criterion measure used. The Teacher Rating Chart is multidimensional, whereas the Gates-MacGinitie Tests are two-dimensional. The determination of which of these is the more accurate or valid measure of reading is beyond the scope of the current resources of this project. However, city-wide results indicate that teachers may be teaching to the mean instructional level in their classes.

TABLE 25

DISCREPANCIES BETWEEN LEVEL OF INSTRUCTION IN READING RATINGS AND GATES-MacGINITIE READING TEST GRADE SCORES

Reading Assessment		Percentage of students at indicated reading level as measured by:		
		Teacher Rating	Gates-MacGinitie	
Rating or Test at End of:	Reading Level	Level of Instruction in Reading	Vocabulary	Comprehension
Grade I	Grade II & above	7%	24%	25%
Grade II	Grade I	37	48	44
	Grade III & above	14	33	32
Grade III	Grade I	13	19	19
	Grade II & below	36	40	44
	Grade IV & above	17	44	42

What follows is an analysis of some characteristics of the children who were selected for further assessment but received no special in-class assistance. This analysis provides a guide to the validity of the selection devices at the completion of the initial phase of selection.

Comparison of Screening Packages

A complete comparison of the two screening packages: Teacher-Psychologist Interview - XO Kirk Test and Teacher-Psychologist Interview - Draw-A-Person - Perceptual Forms, is dependent on an analysis of several areas. A comparison from a decision-making point of view would include information relating to reliability of screening instruments, correlations with criteria, performance of those selected, efficiency and effectiveness in terms of selection and comparative costs and benefits of using the different instruments.

Reliability:

Reliability, as discussed here, serves as a measure of stability of test results. These reliability measures contribute to an estimate of the trustworthiness or dependability of the various screening instruments.

The reliability of the *XO Test* was estimated by the test-retest technique. The author of the *XO Test* (Kirk) found test-retest correlations after one week to be .83 and .74 for Kindergarten children and .78 and .61 for Grade One children for the Quantity Scores and Quality Scores respectively.

In three schools, which are generally representative of Toronto schools, the *XO* was administered as part of the regular Kindergarten screening. The socioeconomic and linguistic characteristics of the three school populations were as follows:

School	English not first language	Lower socio-economic group
A	29%	20%
B	19	44
C	79	74

The first *XO* administration was in March and the retest was in the final week in May and the first week in June. There were approximately ten weeks between test administrations.

The two sets of scores were then correlated to determine the extent to which the scores were stable over the ten-week interval. The correlations between the two sets of scores were highly significant ($p < .005$). The *XO* Quantity Score had an average (mean) correlation coefficient of $r = .75$; $N = 288$.

The XO Quality Score had an average (mean) correlation coefficient of r = .53; N = 288.

The test-retest technique was also used in four schools employing an eight-month interval (March - November) between test administrations. The socioeconomic and linguistic characteristics of these four school populations were as follows:

School	English not first language	Lower socio-economic group
A	2%	4%
B	6	5
C	27	55
D	28	35

The XO Quantity Score had an average (mean) correlation of r= .55; N = 256; the XO Quality Score had an average (mean) correlation of r = .45; N = 256.

Not surprisingly, as the time between test administration increases the reliability of the scores decreases. The Total Quantity Score is much more reliable than the Total Quality Score. Neither scale, over these time periods, is notably reliable. Although practice effects should be relatively slight, differential maturational effects could be profound particularly over the eight-month time period.

The reliability of the scoring technique for the XO Test was also calculated. Each of three people scored the tests of 20 children. The scorers did not know the scores assigned by the others. The average (mean) correlation among the three scorers was $r = .97$ for the Total Quantity Score and $r = .79$ for the Total Quality Score. The scoring reliability for the Total Quantity Score is nearly perfect, and for the Total Quality Score the scoring reliability is good.

Test-retest reliability for the D.A.P. and Perceptual Forms was estimated from a study in one school (52% English not first language, 51% Lower socioeconomic group). The interval between testing sessions was seven months. The correlation for the D.A.P. I.Q. was $r = .50$. The correlation for the Perceptual Forms was $r = .42$. Since only one school was involved, these results should be interpreted cautiously.

The average (mean) scoring reliability among four scorers was $r = .95$ for the D.A.P. I.Q. The average (mean) scoring reliability among six scorers was $r = .80$ for the Perceptual Forms.

Over a similar time period, the test-retest correlations for the _XO_ Quantity Score and _D.A.P._ I.Q. are very similar; the _Perceptual Forms_ is about midway between these two scales and the _XO_ Quality Score.

In terms of scorers' reliability there is remarkable similarity between both the _XO_ Quantity Score and the _D.A.P._ I.Q. Score, and between the _XO_ Quality Score and the _Perceptual Forms_ Score.

The _XO_ Quality Score is the least reliable of the four scales in the test-retest situation. The _XO_ Quality Score and the _Perceptual Forms_ Score are least reliable in terms of scoring technique.

These results indicate that the _XO_ Quantity Score and _D.A.P._ I.Q. are more reliable than the _XO_ Quality and _Perceptual Forms_ Scores.

Correlations of T.P.I., XO, D.A.P. and P.F. with the Criteria

The correlations obtained in one study were obtained from several schools in which the XO had been administered in Grade One. The Gates-MacGinitie was administered to different schools in different grades. The Kirk XO administration and scoring standards were used.

Because of sampling variations the correlations for these samples may not be directly comparable from sample to sample.

The socioeconomic and linguistic characteristics of the schools involved in these samples are presented in Tables 26 and 27.

Prior experience with the Gates-MacGinitie had shown it could not be successfully used with the Toronto population in the lower grades when the tests were administered to the grade level of students for whom the tests were intended.

Grade Two tests could not be used successfully with Grade Two children because there was little differentiation in the low end of the distribution. Far too many children scored in the lowest score category to permit any meaningful evaluation of the reading performance of the low scoring students.

To correct this situation the children were administered a test one grade level below their grade level whenever possible.

TABLE 26

XO GRADE ONE ADMINISTRATION

SOCIOECONOMIC AND LINGUISTIC CHARACTERISTICS OF SCHOOLS INVOLVED IN GATES-MacGINITIE READING TEST ADMINISTRATION

SAMPLE 1			SAMPLE 2		
Grade I			Grade II		
School	English not first language	Lower socio-economic group	School	English not first language	Lower socio-economic group
A	14%	43%	A	13%	11%
B	78	79	B	21	71
C	45	48	C	28	35
D	10	9	D	38	61
E	83	81	E	39	56
F	52	51	Grade III		
G	44	51	A	13%	11%
H	42	61	B	13	74
I	13	52	C	39	56
J	82	78			
K	69	70	SAMPLE I		
L	14	75	Grade II		
M	51	46	A	10%	9%
N	2	4	B	83	81
			C	52	51
			D	18	64
			E	27	55
			F	6	5

TABLE 27

XO KINDERGARTEN ADMINISTRATION

SOCIOECONOMIC AND LINGUISTIC CHARACTERISTICS OF SCHOOLS INVOLVED IN GATES-MacGINITIE READING TEST ADMINISTRATION

Schools	English not first language	Lower socio-economic group
Grade I		
A	27%	55%
B	6	5
C	39	46
D	28	35
Grade II		
A	27%	55%
B	6	5
C	21	60
D	14	12
E	39	46

Thus, children in Grade Two were given the *Gates-MacGinitie* test for Grade One.

When the *Gates-MacGinitie* was administered to children a grade level above the grade level of the test, standard scores could not be used. Grade equivalent scores were used instead since they are not dependent on the grade level of the students or of the test. Grade equivalent scores are not of an interval scale. At the low end of the scale a difference of one raw score point may make one month difference in grade score. At the high end of the scale a difference of one raw score point may make one year difference in grade score.

When non-normal distributions of scores are correlated the range of possible correlation coefficients is less than from -1 to +1. In the correlations in the accompanying tables the *IQ* distributions are near normal. The *Teacher Rating* distributions are somewhat skewed and the *Gates-MacGinitie* distributions are very skewed. In these cases the range of coefficients is restricted and the coefficients obtained may be considered to be conservative estimates of the correlations between the underlying variables. See Tables 28, 29, 30 and 31.

The *IQ* was administered twice, to the same students, in four schools. The socioeconomic and linguistic characteristics of

TABLE 28

CORRELATION COEFFICIENTS OF XO ADMINISTERED IN GRADE ONE AND LEVEL OF INSTRUCTION IN READING AT END OF GRADES ONE, TWO AND THREE.

End of Grade	XO Quantity Score				XO Quality Score			
	Sample 1		Sample 2		Sample 1		Sample 2	
	N	r	N	r	N	r	N	r
I	3436	.46	1268	.53	3436	.42	1268	.52
II	2534	.36	1013	.50	2534	.33	1013	.50
III	-	-	854	.41	-	-	854	.44

TABLE 29

CORRELAT[illegible] COEFFICIENTS OF EO ADMINISTERED IN GRADE ONE AND GATES-MacGINITIE VOCABULARY AND COMPREHENSION SCORES AT END OF GRADES ONE, TWO AND THREE.

	Vocabulary							
	EO Quantity Score				EO Quality Score			
	Sample 1		Sample 2		Sample 1		Sample 2	
End of Grade	N	r	N	r	N	r	N	r
I	1130	.30	-	-	1130	.27	-	-
II	348	.31	323	.40	348	.29	323	.41
III	-	-	148	.35	-	-	148	.45

	Comprehension							
	EO Quantity Score				EO Quality Score			
	Sample 1		Sample 2		Sample 1		Sample 2	
End of Grade	N	r	N	r	N	r	N	r
I	1130	.35	-	-	1130	.29	-	-
II	348	.34	323	.42	348	.33	323	.40
III	-	-	148	.36	-	-	148	.48

TABLE 30

CORRELATION COEFFICIENTS OF XO ADMINISTERED IN KINDERGARTEN AND LEVEL OF INSTRUCTION IN READING AT END OF GRADES ONE AND TWO.

End of Grade	XO Quantity Score				XO Quality Score			
	Sample 1		Sample 2		Sample 1		Sample 2	
	N	r	N	r	N	r	N	r
I	772	.50	1152	.35	772	.53	1152	.35
II	642	.37	-	-	642	.42	-	-

TABLE 31

CORRELATION COEFFICIENTS OF XO ADMINISTERED IN KINDERGARTEN AND GATES-MacGINITIE VOCABULARY AND COMPREHENSION SCORES AT END OF GRADES ONE AND TWO.

	Vocabulary			
	XO Quantity Score		XO Quality Score	
	Sample 1		Sample 1	
End of Grade:	N	r	N	r
I	221	.43	221	.45
II	232	.36	232	.46

	Comprehension			
	XO Quantity Score		XO Quality Score	
	Sample 1		Sample 1	
End of Grade:	N	r	N	r
I	221	.41	221	.42
II	232	.38	232	.47

these four schools were as follows:

School	English not first language	Lower socio-economic group
A	28%	35%
B	27	55
C	6	5
D	2	4

The time period between the test administrations was from March to November. This procedure allows a comparison of Kindergarten and Grade One administrations of the XO. The correlations of the XO scores and Level of Instruction in Reading and Gates-MacGinitie scores may be seen in Tables 32 and 33.

In Tables 32 and 33 the correlations for each of the Kindergarten and Grade One XO administrations are presented for Quantity and XO Quality scores for Level of Instruction in Reading, and Gates-MacGinitie scores for the end of Grades One and Two. In terms of the average (mean) correlations, higher correlations tend to be obtained in Grade One than in Kindergarten and XO Quantity correlations tend to be higher than XO Quality correlations.

TABLE 32

CORRELATION COEFFICIENTS OF XO ADMINISTERED IN KINDERGARTEN AND GRADE ONE AND LEVEL OF INSTRUCTION IN READING AT END OF GRADES ONE AND TWO IN FOUR SCHOOLS.

Level of Instruction in Reading at end of Grade:	School					
	A			B		
	XO Administered in Grade:					
	K		I	K		I
I	r	N	r	r	N	r
XO Quantity	.384	31	.552	.372	69	.385
XO Quality	.398		.333	.275		.298
II						
XO Quantity	.091	15	.164	.335	70	.368
XO Quality	.355		.150	.376		.280

Level of Instruction in Reading at end of Grade:	School					
	C			D		
	XO Administered in Grade:					
	K		I	K		I
I	r	N	r	r	N	r
XO Quantity	.501	48	.592	.549	66	.614
XO Quality	.563		.567	.442		.546
II						
XO Quantity	.269	32	.553	.332	63	.338
XO Quality	.299		.286	.259		.409

TABLE 33

CORRELATION COEFFICIENTS OF XO ADMINISTERED IN KINDERGARTEN AND GRADE ONE AND GATES-MacGINITIE VOCABULARY AND COMPREHENSION SCORES AT THE END OF GRADE ONE IN FOUR SCHOOLS AND GRADE TWO IN TWO SCHOOLS.

Gates-MacGinitie at end of Grade I	School					
	A			B		
	XO Administered in Grade:					
	K		I	K		I
Vocabulary	r	N	r	r	N	r
XO Quantity	.437	31	.630	.165	67	.300
XO Quality	.579		.648	.201		.268
Comprehension						
XO Quantity	.577	31	.664	.301	67	.230
XO Quality	.676		.701	.309		.260

Gates-MacGinitie at end of Grade I	School					
	C			D		
	XO Administered in Grade:					
	K		I	K		I
Vocabulary	r	N	r	r	N	r
XO Quantity	.430	49	.574	.707	40	.728
XO Quality	.423		.492	.426		.593
Comprehension						
XO Quantity	.395	49	.447	.668	40	.699
XO Quality	.369		.410	.558		.612

TABLE 33 (Cont'd)

Gates-MacGinitie at end of Grade I	School					
	B			C		
	XO Administered in Grade:					
	K		I	K		I
Vocabulary	r	N	r	r	N	r
XO Quantity	.534	65	.460	.415	41	.341
XO Quality	.249		.253	.496		.459
Comprehension						
XO Quantity	.436	65	.442	.439	41	.364
XO Quality	.325		.345	.280		.452

In each of three socioeconomically and linguistically diverse schools the total number score derived from the Teacher-Psychologist Interview, XO, D.A.P., and Perceptual Forms Scores were correlated with the Level of Instruction in Reading as reported by the teacher at the end of Grade One and at the end of Grade Two.

The socioeconomic and linguistic characteristics of the schools were:

School	English not first language	Lower socio-economic group
A	52%	51%
B	83	81
C	10	9

The predictive instruments were administered in the Fall of the Grade One year.

For the Grade One criterion the XO is the best single predictor. The Perceptual Forms test tends to give the lowest correlation. The T.P.I. and D.A.P. have correlation values in the middle of the range and T.P.I. is closest to the XO correlation. For the Grade Two criterion the T.P.I. is the best of these single predictors. The XO, D.A.P., and Perceptual Forms are about equal in the size of correlation with Grade Two Level of Instruction in Reading. Used singly the XO or T.P.I. would be better predictors than the D.A.P. or Perceptual Forms. See Table 34.

TABLE 34

CORRELATIONS FOR TEACHER-PSYCHOLOGIST INTERVIEW, XO, D.A.P., AND PERCEPTUAL FORMS ADMINISTERED IN FALL OF GRADE ONE AND LEVEL OF INSTRUCTION IN READING FOR END OF GRADE ONE AND END OF GRADE TWO

	XO Quality	T-P.I. total (-1)	D.A.P. I.Q.	Perceptual Forms total	Level of Instruction in Reading	
					Grade 1	Grade II
XO Quantity	.65	.29	.27	.21	.42	.29
XO Quality		.22	.21	.25	.26	.23
T-P.I. Total			.31	.31	.35	.37
D.A.P. I.Q.				.35	.23	.29
Perceptual Forms total					.13	.23
Reading Grade I						.60

Using two predictors together rather than singly increases the correlation with the criterion. When predictors are combined, the highest correlation with end of Grade One Level of Instruction in Reading is with the combination of T.P.I. and XO. The combinations of T.P.I. - D.A.P., or T.P.I. - Perceptual Forms have slightly lower correlations with the Grade One criterion than does the T.P.I. - XO. When T.P.I. is used with both D.A.P. and Perceptual Forms, the correlation will approach that of the T.P.I. - XO combination.

The highest correlation of predictors with Grade Two Level of Instruction in Reading is achieved with the combination of T.P.I. administered at beginning of Grade One and end of Grade One Level of Instruction in Reading. The Grade One Level of Instruction in Reading is by far the best single predictor of end of Grade Two Level of Instruction in Reading. The combination of T.P.I. and Grade One Level of Instruction in Reading provides twice as effective prediction (in terms of variance accounted for) as the T.P.I. in combination with either the XO, D.A.P., or Perceptual Forms. This raises the possibility of employing a similar achievement measure in Kindergarten to predict Grade One Level of Instruction in Reading. See Table 35.

Correlations were also obtained for a Kindergarten sample. The Kindergarten sample included 32 schools representing all districts in the city.

TABLE 35

MULTIPLE CORRELATIONS FOR TEACHER-PSYCHOLOGIST INTERVIEW, XO, D.A.P., AND PERCEPTUAL FORMS ADMINISTERED IN THE FALL OF GRADE ONE AND LEVEL OF INSTRUCTION IN READING FOR END OF GRADE ONE AND END OF GRADE TWO

Predictors	Criteria Level of Instruction in Reading Grade One	 Grade Two
XO Quantity and XO Quality	.44	.30
T-P.I. and XO Quantity	.48	.44
T-P.I. and XO Quality	.40	.42
T-P.I. and D.A.P.	.40	.44
T-P.I. and Perceptual Forms	.38	.41
D.A.P. and Perceptual Forms	.26	.35
T-P.I. and Grade One Level of Instruction in Reading		.64

Correlations for XO, D.A.P. and Perceptual Forms administered in Kindergarten in March and April, and Level of Instruction in Reading at the end of Grade One were computed. The highest single correlation with the criterion was obtained with the Perceptual Forms. The XO was nearly as high but the D.A.P. was considerably lower. The Teacher-Psychologist Interview data were not available. See Table 36.

Multiple correlations were also computed. When the two XO scales were combined and the D.A.P. and Perceptual Forms combined the resulting multiple correlations with end of Grade One Level of Instruction in Reading were identical. There was no difference between the XO Scales and the combination of D.A.P. - Perceptual Forms in predicting Grade One Level of Instruction in Reading. See Table 37.

On the basis of this correlational data it may be concluded that for Grade One children the T.P.I. - XO combination is slightly superior to the T.P.I. - D.A.P. - Perceptual Forms combination. The difference, however, is too slight to allow a decision between screening packages to be made on this basis alone. For Kindergarten children there is no difference between the XO and the D.A.P. - Perceptual Forms combination.

TABLE 36

CORRELATIONS FOR XO, D.A.P., AND PERCEPTUAL FORMS ADMINISTERED IN SPRING OF KINDERGARTEN, AND LEVEL OF INSTRUCTION IN READING FOR END OF GRADE ONE

	XO Quality	D.A.P. I.Q.	Perceptual Forms total	End of Grade One Level of Instruction in Reading
XO Quantity	.64	.33	.36	.36
XO Quality		.39	.47	.39
D.A.P. I.Q.			.33	.26
Perceptual Forms total				.41

TABLE 37

MULTIPLE CORRELATIONS OF XO, D.A.P., AND PERCEPTUAL FORMS ADMINISTERED IN SPRING OF KINDERGARTEN AND LEVEL OF INSTRUCTION IN READING FOR END OF GRADE ONE.

Predictors	Criteria
	End of Grade One Level of Instruction in Reading
XO Quantity and XO Quality	.43
D.A.P. and Perceptual Forms	.43

Performance of Selected Children

In order to establish the validity of the selection process, it is necessary to compare the selected and unselected children in terms of their school performance. See Tables 38 and 39 for such a comparison for Grade One and Kindergarten screening respectively.

The two screening packages (*T.P.I.* - *IQ*, and *T.P.I.* - *D.A.P.* - *Perceptual Forms*) were administered in Grade One in nine schools during the Fall terms of two different years. The socioeconomic and linguistic characteristics of these nine schools were as follows:

School	English not first language	Lower socio-economic group
A	45%	48%
B	66	70
C	33	57
D	42	61
E	49	53
F	28	35
G	13	52
H	27	61
I	6	5

More than 700 children were screened in each of these samples. More than 60 children were selected and followed up with further

TABLE 38

COMPARISON OF SELECTED AND UNSELECTED STUDENTS BASED ON FALL GRADE ONE SCREENING IN TERMS OF LEVEL OF INSTRUCTION IN READING AT THE END OF GRADES ONE, TWO, AND THREE, AND GATES-MacGINITIE VOCABULARY AND COMPREHENSION SCORES AT END OF GRADE ONE.

Criteria	Selected Students		Unselected Students		t	p <
	N	Mean	N	Mean		
Level of Instruction in Reading						
Grade One	489	3.13	2140	4.03	9.00	.001
Grade Two	342	5.18	1605	6.33	11.50	.001
Grade Three	169	7.73	1157	8.64	5.69	.001
Gates-MacGinitie						
Vocabulary	123	17.85	409	20.32	2.71	.01
Comprehension	123	18.83	409	20.95	2.30	.05

TABLE 39

COMPARISON OF SELECTED STUDENTS AND ALL STUDENTS SCREENED BASED ON SPRING KINDERGARTEN SCREENING IN TERMS OF LEVEL OF INSTRUCTION IN READING AT THE END OF GRADES ONE AND TWO, AND GATES MacGINITIE VOCABULARY AND COMPREHENSION SCORES AT END OF GRADE ONE.

Criteria	Selected Students		All Students		t	p<
	N	Mean	N	Mean		
Level of Instruction in Reading						
Grade One	261	3.21	710	3.84	5.25	.001
Grade Two	183	5.91	565	6.78	5.12	.001
Gates-MacGinitie						
Vocabulary	183	14.37	483	16.75	5.41	.001
Comprehension	183	13.98	482	16.18	5.37	.001

assessment. The same nine schools were used in both samples; similar numbers of children were screened and similar percentages of children were selected and followed up.

One selection objective is the maximization of the difference between the total group screened and the selected group in terms of achievement as measured by the Level of Instruction in Reading at the end of the school year. In this comparison the T.P.I. - D.A.P. - Perceptual Forms package is slightly superior to the T.P.I. - XO package with the criterion scores used in these studies. The criterion score chosen leads to different groups being selected. The T.P.I. - D.A.P. - Perceptual Forms package selected a slightly larger proportion of children than did the T.P.I. - XO package (11 per cent and 8 per cent respectively).

In the case of both packages there was a difference of approximately 1.5 Level of Instruction in Reading units between the total screened group and the selected group. The magnitude of this difference may be seen in the relative size of the t scores for these comparisons. See Tables 40 and 41.

A comparison was also undertaken for these two packages when used with children in Kindergarten. In nine schools

TABLE 40

COMPARISON OF THE XO TEST AND THE TEACHER-PSYCHOLOGIST INTERVIEW COMPONENTS OF GRADE ONE SCREENING BATTERY IN TERMS OF THE LEVEL OF INSTRUCTION IN READING AT END OF GRADES ONE AND TWO, AND GATES-MacINITIE VOCABULARY AND COMPREHENSION SCORES AT END OF GRADE ONE.

Criteria	Predictor					
	Students Selected by:					
	XO only		T-P.I. only		XO & T-P.I.	
	N	Mean	N	Mean	N	Mean
Level of Instruction in Reading						
Grade One	76	3.25	32	3.13	180	2.31
Grade Two	48	6.29	18	6.28	62	5.52
Gates-MacGinitie						
Vocabulary	23	16.30	7	13.29	42	14.64
Comprehension	23	16.39	7	14.29	42	13.88

Criteria	XO only vs. T-P.I. only		T-P.I. only vs.XO & T-P.I.		XO only vs. XO & T-P.I.	
	t	p<	t	p<	t	p<
Level of Instruction in Reading						
Grade One	0.40	ns	3.15	.05	5.88	.01
Grade Two	0.02	ns	1.43	ns	2.14	.05
Gates-MacGinitie						
Vocabulary	1.54	ns	0.81	ns	1.38	ns
Comprehension	0.85	ns	0.24	ns	1.95	ns

TABLE 41

COMPARISON OF SELECTED STUDENTS AND ALL STUDENTS SCREENED BY XO AND T-P.I. IN GRADE ONE IN TERMS OF LEVEL OF INSTRUCTION IN READING AT END OF GRADES ONE AND TWO AND GATES-MacGINITIE VOCABULARY AND COMPREHENSION SCORES AT END OF GRADES ONE AND TWO.

Criteria	Selected Students		All Students		t	p<
	N	Mean	N	Mean		
Level of Instruction in Reading						
Grade One	319	2.71	3926	3.89	13.88	.001
Grade Two	149	6.01	2799	6.80	5.00	.001
Gates-MacGinitie						
Vocabulary						
Grade One	99	16.34	1238	17.39	1.61	ns
Grade Two	24	24.75	399	26.24	0.89	ns
Comprehension						
Grade One	99	16.17	1236	17.05	1.31	ns
Grade Two	24	25.79	398	26.35	0.30	ns

T.P.I. - D.A.P. - Perceptual Forms were used. In nine other schools T.P.I. - XO were used.

The two groups of children were at comparable levels of achievement in reading one year later, as measured by the end of Grade One Teacher Rating Chart. Each school was matched by language composition and socioeconomic status with a school in the other group. The eighteen schools are representative of the Toronto schools as a whole.

In Table 42 the socioeconomic and linguistic characteristics of these matched schools are presented in terms of the screening tests used.

In the Kindergarten comparison there was no difference between the groups of children selected by each of the two screening packages in terms of the end of Grade One Level of Instruction in Reading. See Table 43. See Table 44 for Inner-City, Non-Inner-City comparison.

In terms of this data alone there is little reason to choose one screening package over the other. For neither administration, Kindergarten, nor Grade One, is a clear advantage indicated for the T.P.I. - XO or T.P.I. - D.A.P. - Perceptual Forms in terms of end of Grade One Level of Instruction in Reading.

TABLE 42

SOCIOECONOMIC AND LINGUISTIC CHARACTERISTICS OF EIGHTEEN MATCHED SCHOOLS

School Pairs	Tests administered			
	D.A.P. - Perceptual Forms		XO	
	English not first language	Lower socio-economic group	English not first language	Lower socio-economic group
A	17%	70%	19%	44%
B	20	20	22	72
C	28	70	29	20
D	40	80	42	76
E	47	42	52	75
F	60	58	53	63
G	74	71	71	72
H	79	79	79	74
I	83	70	79	76

TABLE 43

COMPARISON OF TEACHER-PSYCHOLOGIST INTERVIEW AND XO KINDERGARTEN SCREENING PACKAGE AND TEACHER-PSYCHOLOGIST INTERVIEW AND DRAW-A-PERSON AND PERCEPTUAL FORMS KINDERGARTEN SCREENING PACKAGE IN TERMS OF LEVEL OF INSTRUCTION IN READING AT END OF GRADE ONE.

Criteria	Students Selected by:					
	T-P.I. and XO		T-P.I. and D.A.P. and Perceptual Forms		t	p<
Level of Instruction in Reading	N	Mean	N	Mean		
Grade One	100	3.06	80	3.40	1.48	ns

TABLE 44

COMPARISON OF SELECTED STUDENTS AND ALL STUDENTS SCREENED IN KINDERGARTEN IN TERMS OF LEVEL OF INSTRUCTION IN READING AT THE END OF GRADE ONE FOR ALL SCHOOLS IN THE SAMPLE, INNER-CITY SCHOOLS AND NON-INNER-CITY SCHOOLS.

Criteria	Selected Students		All Students		t	p<
Level of Instruction in Reading	N	Mean	N	Mean		
All Schools	312	3.50	1878	4.35	8.95	.001
Inner-City Schools	195	3.08	1180	3.94	9.56	.001
Non Inner City Schools	117	4.20	698	5.04	5.87	.001

Efficiency and Effectiveness

Efficiency and effectiveness are here discussed in terms of the appropriateness of the children selected for follow-up and the number of children who should have been selected but were not selected. Efficiency may be defined as the proportion of the selected group who in fact should have been selected. A perfectly efficient instrument would only select appropriate children. Effectiveness may be defined as the proportion of children who should have been selected who were in fact selected. A perfectly effective instrument would select all the children who should be selected.

In choosing a selection instrument both efficiency and effectiveness should be maximized, within the constraints of cost.

In the Grade One sample of nine schools discussed earlier, the *Teacher-Psychologist Interview* and *XO* were used as a selection package. The following year in these same nine schools, the *T.P.I.* - *D.A.P.* - *Perceptual Forms* were used as a screening package with that year's Grade One children. The distribution of scores on Level of Instruction in Reading for all children screened differs for the two different years of the sample. The efficiency and effectiveness measures are therefore discussed relative to the performance of all the children screened in that year.

In terms of efficiency, i.e. the performance of those selected, relative to the performance of all children screened, there is no meaningful difference between the *T.P.I.* - *D.A.P.* - *Perceptual Forms* package and the *T.P.I.* - *XO* package. The percentages of selected children at the three lowest levels of Instruction in Reading is larger for the *T.P.I.* - *XO* package than for the *T.P.I.* - *D.A.P.* - *Perceptual Forms* package. But in terms of the ratings of instructional level for all children screened there is little difference between the two packages. For both, there is five times as large a percentage of children at the Readiness level in the selected group than in the group of all children screened. At the Chart Reading level there is four times as large a percentage of children in the selected group as in the group of all children screened in the *T.P.I.* - *D.A.P.* - *Perceptual Forms* sample, and three times as large a percentage in the *T.P.I.* - *XO* sample. At the level of Pre-primer and below, the ratio in both cases is twice as large a percentage of selected children as all children screened.

In terms of effectiveness (i.e., selection of those scoring poorly on end of Grade One Level of Instruction in Reading) the *T.P.I.* - *D.A.P.* - *Perceptual Forms* package is superior to the *T.P.I.* - *XO* package. Of those at Pre-primer level or below, 29 per cent were selected by *T.P.I.* - *D.A.P.* - *Perceptual Forms* and

17 per cent were selected by T.P.I. - XQ. At the Chart Reading and below and the Readiness levels, there is a larger discrepancy between the two packages. At these two lowest levels the T.P.I. - D.A.P. - Perceptual Forms package is 30% more effective than the T.P.I. - XQ package. Sixty-five per cent of the children at the Readiness level were selected by the T.P.I. - D.A.P. - Perceptual Forms package compared to thirty-six per cent selected by the T.P.I. - XQ. See Table 45.

A similar analysis was undertaken for children screened in Kindergarten. In this case only D.A.P. - Perceptual Forms and XQ were compared. The Teacher-Psychologist Interview was not included. This sample was composed of the 18 matched schools mentioned earlier. There is very little difference between the two groups of schools in the distributions of level of achievement in reading as measured by the Teacher Rating Chart.

In terms of efficiency the two sets of screening instruments are similar. The XQ is slightly more efficient at the two lowest Levels of Instruction in Reading. At the Pre-primer level and below the screening instruments are equally efficient.

The XQ is more effective than the D.A.P. - Perceptual Forms at the level of Chart Reading and below and at the Readiness level and below. At the Pre-primer level and below, the D.A.P. - Perceptual Forms package is slightly more effective. See Table 46.

TABLE 45

COMPARISON OF T-P.I. - D.A.P. - PERCEPTUAL FORMS GRADE ONE SCREENING PACKAGE AND T-P.I. - XO GRADE ONE SCREENING PACKAGE IN TERMS OF EFFICIENCY AND EFFECTIVENESS AS INDICATED BY PERCENTAGE OF CHILDREN AT VARIOUS LEVELS OF INSTRUCTION IN READING AT END OF GRADE ONE.

EFFICIENCY

Criteria	Percentage of Children at each Reading Level			
	Screening Package			
	T-P.I. - D.A.P. - PF		T-P.I. - XO	
End of Grade One Level of Instruction in Reading	Selected Students	All Students Screened	Selected Students	All Students Screened
Pre-Primer & below	59%	26%	63%	38%
Chart Reading & below	31	7	47	14
Readiness	19	4	39	8

EFFECTIVENESS

Criteria	Percentage of Children Screened who are in Selected Group	
	Screening Package	
End of Grade One Level of Instruction in Reading	T-P.I. - D.A.P. - PF	T-P.I. - XO
Pre-Primer & below	29%	17%
Chart Reading & below	57	27
Readiness	65	36

TABLE 46

COMPARISON OF D.A.P. - PERCEPTUAL FORMS KINDERGARTEN SCREENING TESTS AND EO KINDERGARTEN TESTS IN TERMS OF EFFICIENCY AND EFFECTIVENESS AS INDICATED BY PERCENTAGE OF CHILDREN AT VARIOUS LEVELS OF INSTRUCTION IN READING AT END OF GRADE ONE.

EFFICIENCY

Criteria	Percentage of Children at Each Reading Level			
	Tests			
	D.A.P. - PF		EO	
End of Grade One Level of Instruction in Reading	Selected Students	All Students Screened	Selected Students	All Students Screened
Pre-Primer & below	60%	32%	64%	31%
Chart Reading & below	21	11	32	10
Readiness	20	7	23	5

EFFECTIVENESS

Criteria	Percentage of all Children Screened who are in Selected Group	
	Tests	
End of Grade One Level of Instruction in Reading	D.A.P. - PF	EO
Pre-Primer & below	40%	35%
Chart Reading & below	40	54
Readiness	55	72

On the basis of these efficiency and effectiveness analyses it may be seen that neither screening package is uniformly superior for Grade One use; the *T.P.I.* - *XO*, and the *T.P.I.* - *D.A.P.* - *Perceptual Forms* are equally efficient. The *T.P.I.* - *D.A.P.* - *Perceptual Forms* is more effective. In the Kindergarten sample for both efficiency and effectiveness the *XO* is slightly superior to the *D.A.P.* - *Perceptual Forms*.

Costs and Benefits

Costs of inefficiency are those associated with selected children who do not need to have follow-up service. In terms of the criterion currently under discussion, a child who rates well on Level of Instruction in Reading need not have been selected for follow-up work. In practice of course, many criteria other than reading are of interest. There are many children who score well on Level of Instruction in Reading but need assistance in other areas. It should be realized that the criterion of Level of Instruction in Reading provides only a minimal estimate of the need for follow-up service.

Costs of inefficiency as measured by reference to end of Grade One Level of Instruction in Reading are relatively minor. Not only do the vast majority of selected children need additional service, but those who do need such service are quickly screened out of further diagnostic work. This screening out procedure involves minimal costs.

Costs of ineffectiveness are those costs associated with children who were not selected for follow-up work but should have been selected. To the extent that non-selection implies lack of service for the children in need of such service, the costs of ineffectiveness may be extensive. There could be serious delays in service to some children. Although it is difficult to think of these costs in quantitative terms, they are clearly greater than the costs associated with inefficiency.

In comparing the test batteries therefore, effectiveness should be given greater weight than efficiency as long as the level of inefficiency is still tolerable. A point exists at which efficiency and effectiveness are balanced, and this is the optimal point within the confines of the comparison. To determine this point, however, one must quantify both dimensions, a task which is beyond the scope of this discussion.

Administrative costs of the two packages are similar. Both the *D.A.P.* - *Perceptual Forms* package and the *XO* require clerical work in preparing the test papers. The *XO* booklet requires more preparation time than the *D.A.P.* and *Perceptual Forms* sheets. Administration of the *XO* requires 5 to 10 minutes. The *D.A.P.* and *Perceptual Forms* require 10 to 15 minutes to administer.

All three tests have been scored by clerical staff. The scoring of the *XO* is more complex and has not been as clearly outlined as the scoring for the *D.A.P.* or *Perceptual Forms* has been. Scoring of the *XO* requires about 2 minutes per child. The *Perceptual Forms* required 15 to 25 seconds and the *D.A.P.* requires 3 to 4 minutes per child.

Beyond the formal scoring, the staff member may make use of the more subjective aspects of the test as well. Time comparisons of this aspect of evaluation are very difficult to measure.

As tools for use in conjunction with a teacher interview the *D.A.P.* and *Perceptual Forms* are superior to the *XO*. Staff members are much more aware of the interpretations that may be made from the *D.A.P.* and *Perceptual Forms* drawings than from the *XO*. The *D.A.P.* and *Perceptual Forms* are much more intuitively reasonable and understandable to teachers as well. As the previously discussed data indicate, the apparent simplicity of the *XO* test is deceptive. The *XO* does measure factors associated with school performance. Despite its considerable potential, until further interpretive work is done, the usefulness of the *XO* in direct work between staff members and teachers may be limited.

Since developmental norms are available for the *D.A.P.* and *Perceptual Forms*, these tests are useful in follow-up work. The *XO* has been used almost exclusively as a screening instrument.

The comparison of the *T.P.I.* - *D.A.P.* - *Perceptual Forms* battery, and the *T.P.I.* - *XO* as screening packages may be summarized as follows:

Test - Retest Reliability:	*XO* Quantity Score and *D.A.P.* are superior to *XO* Quality Score and *Perceptual Forms*.
Scoring Reliability:	*XO* Quantity Score and *D.A.P.* are superior to *XO* Quality Score and *Perceptual Forms*.
Correlations:	For Grade One screening *T.P.I.* - *XO* is slightly superior to *T.P.I.* - *D.A.P.* - *Perceptual Forms*. For Kindergarten screening there is no difference between the *XO* and the *D.A.P.* -*Perceptual Forms*.
Performance of Selected Children:	For Grade One screening *T.P.I.* - *D.A.P.* - *Perceptual Forms* is slightly preferable to *T.P.I.* - *XO*. For Kindergarten screening there was no difference between these two screening packages.

Efficiency:	For Grade One screening there was no difference between screening packages. For Kindergarten screening XO is slightly superior to D.A.P. - Perceptual Forms.
Effectiveness:	For Grade One screening T.P.I. - D.A.P. - Perceptual Forms is superior to T.P.I. - XO. For Kindergarten screening the XO is slightly superior to D.A.P. - Perceptual Forms.
Cost and Benefits:	For Grade One screening T.P.I. - D.A.P. - Perceptual Forms is superior to T.P.I. - XO. For Kindergarten screening D.A.P. - Perceptual Forms is probably superior to XO.

In conclusion, for Grade One screening the T.P.I. - D.A.P. - Perceptual Forms is superior to the T.P.I. - XO package. For Kindergarten screening, except for interpretive aspects, there is essentially no difference between the D.A.P. - Perceptual Forms package and the XO.

BIBLIOGRAPHY

Reference Sources

Buros, Oscar Krisen, Ed. The Sixth Mental Measurements Yearbook. Highland Park, New Jersey: The Gryphon Press, 1965.

Buros, Oscar Krisen, Ed. The Seventh Mental Measurements Yearbook. Highland Park, New Jersey: The Gryphon Press, 1972.

Cronbach, Lee J. and Gleser, Goldine C. Psychological Tests and Personnel Decisions. Urbana, University of Illinois Press, 1957.

de Hirsch, Katrina, Jansky, Jeannette J. and Langford, William S. Predicting Reading Failure: A Preliminary Study New York, Harper and Row, 1966.

Ferinden, William E., Jr., and Jacobson, Sherman. Educational Interpretation of the Wechsler Intelligence Scale for Children (W.I.S.C.). Linden, N.J.: Remediation Associates, 1969.

Furr, Karl and Wilder, Mary Grace. Manual for Teachers. Unpublished manuscript, Toronto: Psychological Services, Toronto Board of Education, 1969.

Ginters, A. A Study of an Instrument for Teacher Screening of Pupils re: Perceptual Handicap. Toronto: Advisory Committee of the Metropolitan Toronto Education and Research Council, E. N. Wright, Chairman. M.T.E.R.C. Distributed Report No. 16, 1966.

BIBLIOGRAPHY

Reference Sources (Cont'd)

Hainsworth, Peter K. and Siqueland, Marian L. *Early Identification of Children with Learning Disabilities: The Meeting Street School Screening Test*. Providence: Crippled Children and Adults of Rhode Island Inc., 1969.

Ilg, Francis L., and Ames, Louise Bates. *School Readiness: Behavior Tests Used at the Gesell Institute*. New York: Harper and Row, 1965.

Isaacs, Susan. *The Children We Teach*. London: University of London Press, 1970.

Johnson, Doris J. and Myklebust, Helmer R. *Learning Disabilities: Educational Principles and Practices*. New York: Grune and Stratton, 1967.

Kephart, Newell C. *Learning Disability: An Educational Adventure*. West Lafayette, Indiana: Kappa Delta Pi, 1968.

Kephart, Newell C. *The Slow Learner in the Classroom*. 2nd ed. Columbus, Ohio: Merrill, 1971.

Kirk, Samuel A. and Kirk, Winifred D. *Psycholinguistic Learning Disabilities: Diagnosis and Remediation*. Urbana, Illinois: University of Illinois Press, 1971.

Lerner, Janet W. *Children with Learning Disabilities*. Boston, Houghton Miffin, 1971.

BIBLIOGRAPHY

Reference Sources (Cont'd)

Marzollo, Jean and Lloyd, Janice. *Learning Through Play*. New York: Harper and Row, 1972.

McCandless, Boyd and Evans, Ellis. *Children and Youth: Psychosocial Development*. Hinsdale, Illinois: The Dryden Press, 1973.

Mitchell, John C. *Human Life: The First Ten Years*. Toronto: Holt, Rinehart, Winston of Canada, 1972.

Ontario Committee, Commission on Emotional and Learning Disorders in Children, R. E. Jones, Chairman. *The Report of the Ontario Committee of the Commission on Emotional and Learning Disorders in Children: a supplementary publication to One Million Children, the CELDIC REPORT*. Toronto: Canadian Council on Children and Youth, 1970.

Sharp, Evelyn. *Thinking is Child's Play*. New York: E.P. Dutton and Co. Inc., 1969.

Sutphin, Florence E. *A Perceptual Testing and Training Handbook for First Grade Teachers*. Winter Haven, Florida: Winter Haven Lions Research Foundation, 1964.

The Commission on Emotional and Learning Disorders in Children, R. H. Shannon, Chairman. *One Million Children - The CELDIC REPORT: A National Study of Canadian Children with*

BIBLIOGRAPHY

Reference Sources (Cont'd)

Emotional and Learning Disorders. Toronto: Leonard Crainford for the Commission on Emotional and Learning Disorders in Children, 1970.

Valett, Robert E. The Remediation of Learning Disabilities: A Handbook of Psychoeducational Resource Programs. Palo Alto, Calif: Fearon Publishers, 1967.

van de Vegte, H. G. and Hoddinott, B. A. Some Notes on a Rehabilitation Programme for Children with Specific Learning Disabilities. Toronto: Ontario Association for Children with Learning Disabilities, 1968.

Wettlaufer, Margaret. Children's World: Holt's Early Childhood Program. Teacher's Guide. New York, Toronto (etc.): Holt, Rinehart and Winston, 1968.

Wright, E. N. Student's Background and Its Relationship to Class and Programme in School (The Every Student Survey), Toronto: Research Department, The Board of Education for the City of Toronto, 1970a.

Wright, E. N. Personal Communication, 1970b.

BIBLIOGRAPHY

Tests

Anton Brenner Developmental Gestalt Test of School Readiness, Anton Brenner, 1964, Western Psychological Services.

Auditory Discrimination Test, Joseph M. Wepman, 1958, Language Research Associates Inc.

Basic Concept Inventory, Field Research Edition, Siegfried E. Engelman, 1967, Follett Education Corporation.

Bender Gestalt Test for Young Children, Elizabeth Munsterberg Koppitz, 1964, Grune and Stratton, Inc.

Boehn Test of Basic Concepts. Ann Boehn, 1969, The Psychological Corporation.

Children's Drawings as Measures of Intellectual Maturity: A Revision and Extension of the Goodenough Draw-A-Man Test, Harris, Dale D., 1963, New York, Harcourt, Brace and World.

Coloured Progressive Matrices, John C. Raven, 1963, H. K. Leeds and Co. Ltd., (U.S. distributor: Psychological Corporation).

Detroit Tests of Learning Aptitude, Harry J. Baker and Bernice Leland, 1935, Revised 1959, The Bobbs - Merrill Company,Inc.

Developmental Test of Visual-Motor Integration, Keith E. Berry and Norman A. Buktenica, 1967, Follett Educational Corporation, Chicago.

Durrell Analysis of Reading Difficulty, New Edition, Donald D. Durrell, 1955, Harcourt, Brace and World, Inc.

BIBLIOGRAPHY

Tests (Cont'd)

Gates MacGinitie Reading Tests, Arthur I. Gates and Walter H. MacGinitie, 1965, Teachers College Press.

Group Perceptual Screening at First Grade Level, Kelly, George R., Journal of Learning Disabilities, V13, #12, November 1970, Pg. 41-45.

Illinois Test of Psycholinguistic Abilities, Revised Edition, Samuel A. Kirk, James J. McCarthy and Winifred Kirk, 1968, University of Illinois Press.

Kirk XO Test: A Group-Administered Test for Kindergarten Children, for Early Identification of Learning-Disabled Children, Ruth V. Kirk, In Preparation.

Leiter International Performance Scale, Russell Grayton Leiter, 1966, Western Psychological Services.

Marianne Frostig Developmental Test of Visual Perception, 3rd Edition, Marianne Frostig, 1966, Consulting Psychologists Press, Inc.

Measurement of Intelligence by Drawings, Goodenough, Florence L., 1926, Chicago, World Book Company.

Meeting Street School Screening Test, Peter K. Hainsworth and Marian L. Siqueland, 1969, Crippled Children and Adults of Rhode Island, Inc.

Peabody Picture Vocabulary Test, Lloyd, M. Dunn, 1959, American Guidance Service Inc.

BIBLIOGRAPHY

Tests (Cont'd)

Perceptual Forms Test, 1969, Winter Haven Lions Research Foundation, Inc.

Pintner - Cunningham Primary Abilities Test, Rudolph Pintner, Bess V. Cunningham and Walter N. Durost, 1964, Harcourt, Brace and World.

Pre-Reading Screening Procedures, Beth H. Slingerland, 1969, Educators Publishing Service, Inc.

Purdue Perceptual-Motor Survey, Eugene G. Roach and Newell C. Kephart, 1966, Charles E. Merrill Publishing Co.

Slosson Intelligence Test, Richard L. Slosson, 1963, Slosson Educational Publications.

S.R.A. Primary Mental Abilities, Thelma Quinn Thurstone, 1962, Science Research Associates, Inc.

Stanford-Binet Intelligence Scale, Third Revision: Lewis M. Terman and Maud A. Merrill, 1964, Houghton Mifflin Co.

Standard Progressive Matrices, John C. Raven, 1958, H.K. Lewis and Co. Ltd., (U.S. distributor: Psychological Corporation).

Visual Motor Gestalt Test, Lauretta Bender, 1946, American Orthopsychiatric Association, Inc.

Wechsler Intelligence Scale for Children, David Wechsler, 1949, Psychological Corporation.

Wechsler Preschool and Primary Scale of Intelligence, David Wechsler, 1967, Psychological Corporation.

Wide Range Achievement Test, J. F. Jastak, S. R. Jastak, and S. W. Bijou, 1965, Guidance Associates.

APPENDIX

A. Drafts of Letters to Parents to be Considered
by Principal

B. Instructions for Administering *Perceptual Forms Test* and *Draw-A-Person*.
Scoring Guide for *Perceptual Forms*
Criterion Score Tables for *Perceptual Forms* and *Draw-A-Person*

C. *Pupil Description Scale*
Teacher-Psychologist Interview
Teacher Screening Form

D. Post-Screening Letters to Principal

E. *Teacher's Rating Chart* (A)
Teacher's Rating Chart (B)
Teacher's Rating Chart Reliability (B)

F. *Forest Hill Health Form*

A

Drafts of Letters
to Parents
to be
Considered by Principal

To The Parents of Grade One Children:

During the next few weeks, a special program will be taking place in the Grade One Classes at ______________ school. ________________________________ of the Board's Psychological Services, will observe in each classroom, give some simple tests and consult with the teacher as the year goes along.

The purpose of this service is to help the teacher plan the best program for each child. Parents who wish to discuss the program may call ________________________ at __________________________ school, ____________________.

____

Principal

Dear Parents:

For the past five years the Grade One children in many Toronto Schools have been assessed as part of a research-and-service project called the "Early Identification and Developmental Program". This screening program helps to identify at an early age the children who need special help, and is often useful for teachers in planning classroom activities.

This program has now become part of the regular school service at ________________ School. All the Grade One children will be given group tests and possibly have brief individual contact with the psychoeducational consultant. If any further contact seems necessary to identify problems in learning we will, of course, be in touch with you.

____

Principal.

To the Parents of Kindergarten Children:

Each year for the past several years a screening of all Kindergarten students has been conducted by our Psychological Services Department at _______________Public School. It is felt that this service has been quite valuable in the past to the school and parents and hence another screening of present Kindergarten children at _______________School will be done this year. The purpose of this program is to help discover the learning styles of the children in order to design the best possible educational program to meet their individual requirements. Significant data will be retained by Psychological Services for purposes of following developmental progress.

The process will involve group and individual testing, classroom observations and continuing consultations with the classroom teacher and parents. It will be carried out in our school by ____________________ who is responsible this year for the psychological services in our primary grades. ______ ____________________ has asked me if it would be possible for her to obtain some background information concerning your child's previous school experiences and languages spoken at home. She would find this of great value. I am enclosing a brief background information sheet that I hope you will be kind enough to fill in and return to the Kindergarten teacher as soon as possible.

If a further assessment is indicated by the above screening, ____________________ will get in touch with you to discuss it and to obtain your permission to investigate further. She will be glad to talk with you about the program at any time and arrangements for this can be made through the school office by telephone (   ).

Yours truly,

Principal.

Enclosure

BACKGROUND INFORMATION

Child's Name ....

1. How many years of schooling did your child have before entering Kindergarten? ....
   Type of school(s) ....
   ....

2. What languages are spoken in your home? (Put the most commonly spoken language first).
   ....
   ....
   ....
   ....
   ....

Would you please return this to the Kindergarten teacher as soon as possible.

....
Parent's Signature

B

Instructions for Administering

Perceptual Forms Test

and

Draw-A-Person

Scoring Guide for Perceptual Forms

Instructions for Administering
Perceptual Forms and Draw-A-Person

The Perceptual Forms and Draw-A-Person are drawn on two sheets of paper which have been stapled together. The papers should be prelabelled with each child's name and date of birth, as some children will be unable to print their names legibly, and birthdates are required for scoring. The teacher can help the children to get organized, and insure that everyone has a pencil. No crayons or erasers should be available.

The Perceptual Forms are displayed one at a time, either by holding up a large card or by projecting the designs on a screen. The children are asked to copy each one as well as they can. It is helpful to acknowledge that the last three cards (divided rectangle, and 2 diamonds) are difficult. For Kindergarten children the diamonds may be omitted. Also ask the children to write their name if they can.

The Draw-A-Person can be drawn on the back of the second sheet of paper, to save confusion with opening and folding the 2-page "booklet". When all are ready, the children are asked to "draw a person, a boy or girl, man or lady, draw the best person you can, do the whole person and only do one. Do it as quietly as you can". Sometimes it is necessary to add a comment to discourage copying and to limit talking. Most of the children will complete their drawings very quickly. It is helpful to ask them to turn their papers over and put down their pencils after the drawing is finished, in order to prevent scribbling, etc. Stragglers can be encouraged by the suggestion that "when I count to 10 it will be time to stop".

As the Perceptual Forms can be controlled for time more easily than Draw-A-Person, it is usually preferable to administer Perceptual Forms first.

Additional informal group tests (such as number and letter printing, hand tracing, etc.), may be administered using the inside pages of the 2-page "booklet".

✓

Development of Scoring Criteria For Perceptual Forms

In developing a scoring system which would be appropriate for the early identification program four major constraints were considered:

a. The scoring system would have to be appropriate for the Kindergarten and Grade One children in the project.

b. Thousands of tests would have to be scored in a few weeks.

c. The scoring system must facilitate the selection of a group of students for further assessment.

d. The scoring should be done by clerical personnel.

In order to develop a scoring system, drawings from 180 Kindergarten children were collected. These drawings were from the total Kindergarten population of four schools. Two of the schools are Inner-City Schools, i.e., relatively low socioeconomic areas, and two schools are from relatively high socioeconomic areas.

School	English not first language	Lower socio-economic group
A	17%	70%
B	10	72
C	14	12
D	9	5

The drawings from the children in the four schools were combined into one group so the drawings were not identified by school.

This group of 180 sets of drawings was then scored by three psychological services staff members using a "high, medium and low" categorization.

It was noted that a wide variety of competence was evident in the large "low" category. While some Kindergarten children obviously perceived the shapes with fair accuracy and merely scored poorly because of shaky motor control of an imperfect sense of proportion, others were committing serious errors in proportion, showing directional confusions or very poor eye-motor coordination, and still others were totally unable to handle most of the shapes, in a few cases doing such poor or bizarre work that it was impossible to distinguish among the figures. For E.I.D.P. work it appeared that these distinctions in the "low" category would be very important, while the finer distinctions apparent between the "medium" score and the upper end of the "low" score would not be particularly useful for distinguishing problem areas, and generally seemed to convey little predictive information about the child.

It was particularly interesting to note that little difference existed between the drawing performances of the two widely differing school areas. Although the non-inner-city schools had somewhat more drawings rating toward the high end of the continuum, they also had many drawings which were as poor as the poorest inner-city school drawings. This suggested that the need for a revised scoring system existed for all Kindergarten-age children, rather than for a particular group.

It was decided to select and define four new scoring categories. These, from highest to lowest, would be named Category 3, 2, 1 and 0, and would receive corresponding numerical scores.

Using these categories, the drawings were tentatively assigned new scores. It was noticed that each new category was well represented by the four point scoring method. Possible borderline or questionable drawings were set aside and scored only after discussion among the scorers. When scoring, developmental and perceptual features were taken into account whenever possible. For example, a poorly controlled and unbalanced cross might receive a score of "1", while a superficially more accurate cross, but with the horizontal bars starting from the centre, thus indicating a possible midline problem, would receive a score of "0". Similarly a divided rectangle might receive a score of "3" if the crossing lines failed to intersect at the precise centre point. However, a score of "2" was obtained if the subject was more accurate, yet drew a large dot at the point of intersection, suggesting traces of the developmentally earlier "star pattern" drawings.

The scored drawings were next reexamined and the characteristic or determining features for each score, for each perceptual form, were noted.

Drawings representative of each category and each shape were selected, and particular care was teken to include the questionable or borderline cases which had been difficult to score initially.

The descriptions of each form and selected sample drawings follow.

Scoring of Perceptual Forms

In general, it should be noted that:

- No penalty is given for size of drawings unless this becomes so extreme that it makes scoring difficult.

- Second or third attempts are accepted if done spontaneously but not if suggested by examiner.

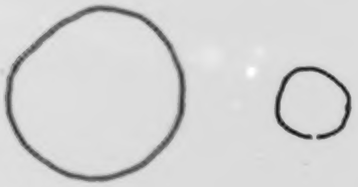
- On group tests rotation of the page cannot be penalized, but rotations of the figure are penalized.

- There is no reduction of score for poor arrangement or orientation on the page, or for overlap, but if the child uses the page edge or previously drawn line to form an integral part of a new figure he is penalized.

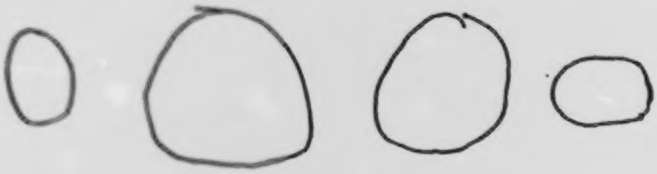
CIRCLE

Score 3 - Shape approximately round.
Fairly neat closure.

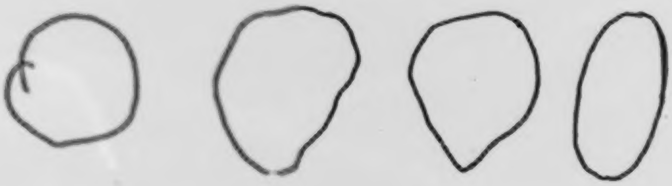
BEST COPY AVAILABLE



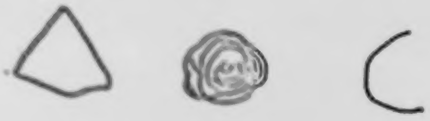
Score 2 - Somewhat flattened, otherwise satisfactory.
Some overlap or failure to join at point of closure, otherwise satisfactory.
Generally poor motor control, line somewhat wiggly but overall proportions of circle still fairly good.



Score 1 - Circle flattened so one diameter is greater than 1½ x other diameter.
Shape of circle is largely though not entirely lost, e.g. through very distorted closure, the formation of an angle or one greatly flattened side.



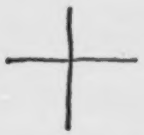
Score 0 - Figure has become completely unrecognizable despite examiner's knowledge of which shapes the subject has been given to draw.



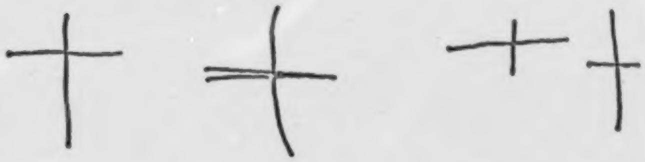
CROSS

BEST COPY AVAILABLE

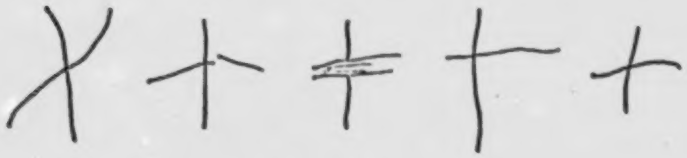
Score 3 - Proportion and length of lines fairly accurate.
Lines approximately vertical and horizontal.
Figure drawn in two lines without a break at the centre.



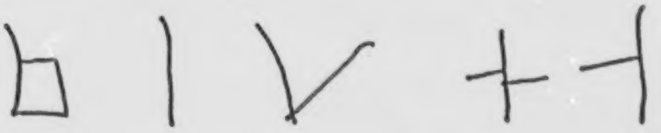
Score 2 - Length of lines and/or proportion somewhat inaccurate, otherwise satisfactory.
One line poorly executed, tilted up to 15% and/or one line somewhat curved, crooked, or redone, otherwise satisfactory.



Score 1 - X rather than +. One line crossing other only near the end, or broken so as to suggest midline difficulties.
One or both lines very wavy.



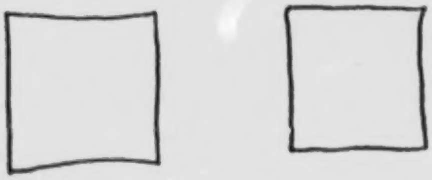
Score 0 - Figure completely unrecognizable. No figure Gestalt evident.



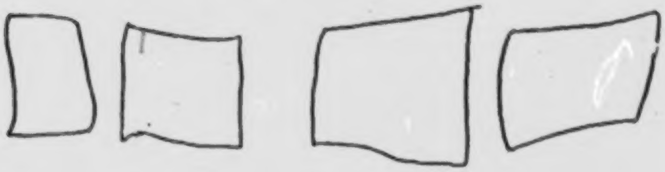
SQUARE

Score 3 - Four sides approximately equal in length.
Four corners fairly equal in size.

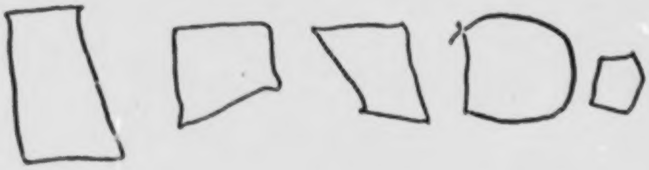
BEST COPY AVAILABLE



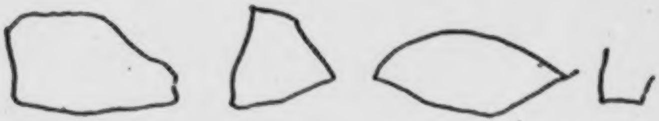
Score 2 - One or more sides curved, or poorly executed but angles still fairly adequate.
Angles somewhat unequal in size but square shape still apparent.
Length or width of one pair of sides not more than 1½ X that of the other pair, angles fairly accurate.



Score 1 - Length or width more than 1½ X that of the other sides.
One or more angles extremely distorted in size.
One side so waved that square almost unrecognizable, or one corner completely rounded.



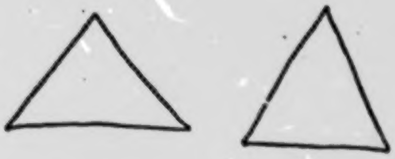
Score 0 - Figure completely unrecognizable.



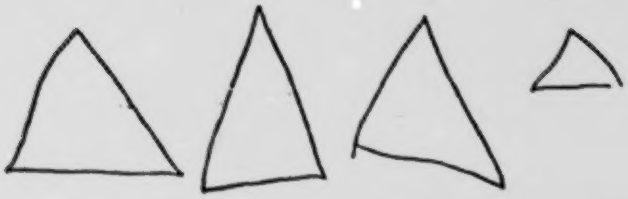
BEST COPY AVAILABLE

TRIANGLE

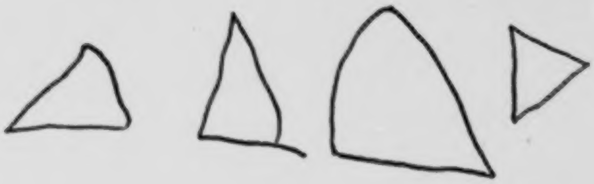
Score 3 - Two or three sides almost equal in length; base may be a little longer or shorter.
Angles approximately equal in size, lines straight, and vertex of triangle approximately centered over base line.



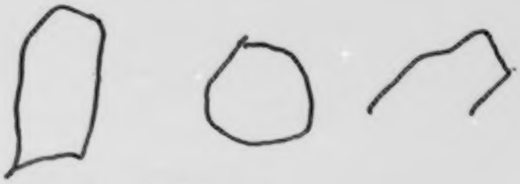
Score 2 - One or two sides somewhat wavy.
Base line up to 30° off horizontal.
Sides somewhat uneven in length.
Incomplete closure.
(Score can be given if 2 or 3 errors are present, as long as none is very severe.)



Score 1 - One or more sides extremely curved.
Base off horizontal more than 30°.
Angles very uneven or somewhat rounded.
One side considerably shorter than others.
(More than one of these errors can be present if the figure remains recognizable.)



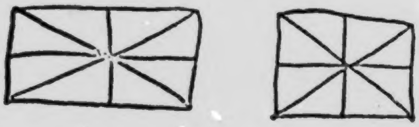
Score 0 - Figure unrecognizable.



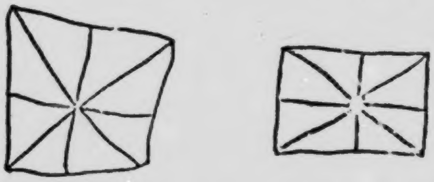
RECTANGLE

Score 3 - Proportions and angles approximately correct, lines fairly straight.
Lines cross at or near the centre of the figure.
Lines meet at or almost at a common point.
Lines are drawn continuously, not visibly stopping at the centre.

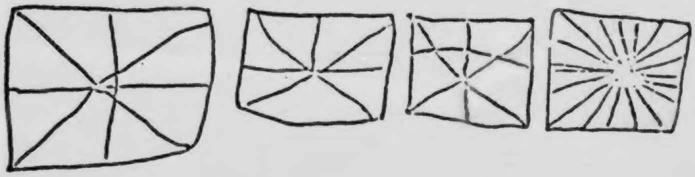
BEST COPY AVAILABLE



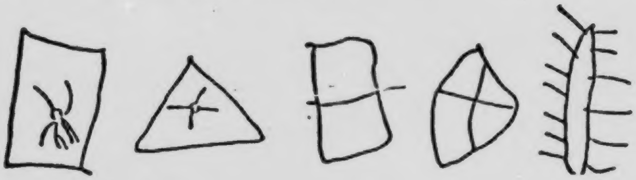
Score 2 - Sides somewhat unequal in length, sides or intersecting lines somewhat wavy.
Intersecting lines do not cross at or near a common central point, or lines are drawn to meet rather than cross in the centre. A heavily marked centre dot may be present.
Figure square rather than in proper proportions, and/or one or more angles quite poorly formed.



Score 1 - One angle missing, rounded, rectangular shape unclear.
Lines intersect extremely poorly failing to pass near a common point.
Extra lines or insufficient number of lines present, otherwise fairly satisfactory figure.
Lines fail to go to the correct general area on the circumference of the figure, e.g. don't go to the corners.

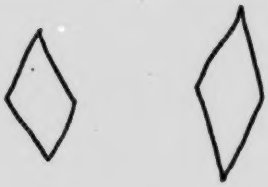


Score 0 - Figure unrecognizable or clearly poorer than those receiving a score of one.



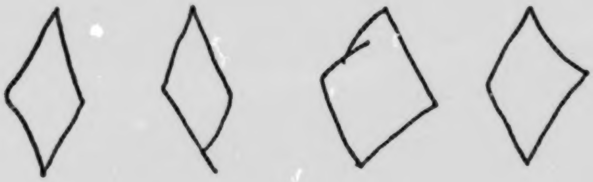
VERTICAL DIAMOND

Score 3 - Lines fairly straight, sides approximately equal in length.
Opposite angles approximately equal in size.
Height of figure noticeably greater than width.

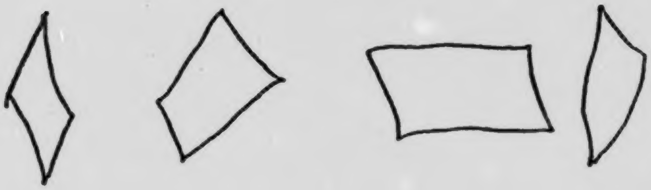


BEST COPY AVAILABLE

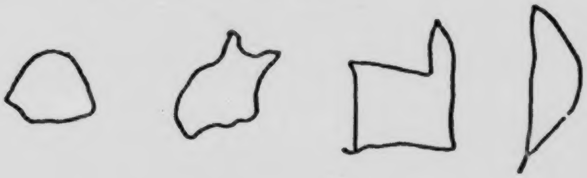
Score 2 - One or two lines somewhat curved or poorly controlled.
One or two sides noticeably longer or shorter than others, or angles unequal but general shape of figure is recognizable.
Figure generally good but height not apparently greater than length.



Score 1 - Figure tilted or angles distorted so that a rectangle rather than a diamond results.
One or two lines or one angle very curved, wavy or poorly executed.
Ears or other distortions present though shape still recognizable.
Figure rotated.
Width of diamond obviously greater than height.



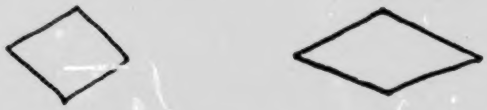
Score 0 - Shape completely unrecognizable.
Extra or fewer sides present.



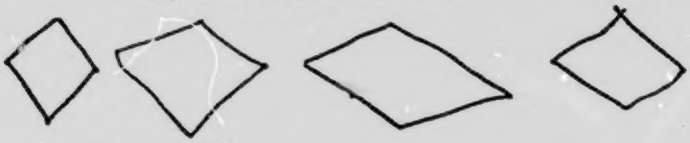
HORIZONTAL DIAMOND

Score 3 - Lines fairly straight, sides approximately equal in length.
Opposite angles approximately equal in size.
Width of figure noticeably greater than height.

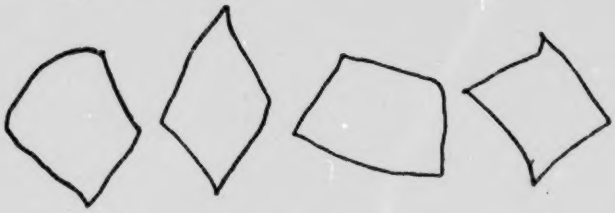
BEST COPY AVAILABLE



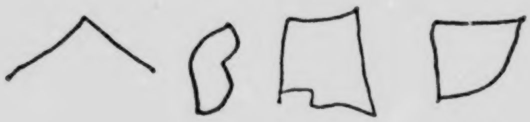
Score 2 - Figure generally good, but length not apparently greater than height.
One or two lines somewhat curved or poorly controlled.
One or two sides noticeably longer or shorter than others, or angles unequal but general shape of figure is recognizable.



Score 1 - Figure tilted or angles distorted so that a rectangle rather than a diamond results.
One or two lines or one angle very curved, wavy, or poorly executed.
Height of diamond obviously greater than width.
Ears or other distortions present though shape still recognizable.
Figure rotated.



Score 0 - Shape completely unrecognizable.
Extra or fewer sides present.



Criterion Scores For Selecting Children For Further Assessment

When the D.A.P. and Perceptual Forms are used together in selecting children for follow-up there is a certain amount of overlap. Some children obtain scores which are below the respective selection criterion on both measures. The extent of this overlap varies considerably among schools. As an average, about one third of the children scoring below the criterion on one measure also score below the criterion on the other measure.

The number of children selected by the D.A.P. and Perceptual Forms used together will tend to be approximately 80 per cent of the sum of the numbers selected by both measures. For example, if a D.A.P. criterion produces five per cent selected and a Perceptual Forms criterion produces six per cent selected, the use of both measures will produce approximately nine per cent selected.

Tables for determining criteria scores for each of the six areas of Toronto follow. To use the tables, determine the approximate per cent of the students screened to be selected, find the nearest percentage in the column for the area in which the school is located, find the corresponding test score in the left most column. This test score is the score below which the listed per cent of students will be selected.

TABLE 47

CRITERION SCORES OF GRADE ONE D.A.P. FOR SIX TORONTO AREAS

D.A.P. I.Q. Criterion Scores	Percentage of Students Below Criterion Scores					
	Administrative Area of Toronto					
	1	2	3	4	5	6
55	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%
60	0.3	0.3	0.4	0.5	0.4	0.3
65	1.1	1.3	1.6	1.6	1.3	0.7
70	2.6	3.1	2.7	3.4	3.2	2.6
75	5.7	7.8	9.3	8.4	6.8	4.5
80	11.4	14.1	14.7	16.2	13.8	9.6
85	21.0	23.8	22.8	26.3	22.5	16.6
90	32.3	36.3	35.7	40.0	30.7	25.0
N	1592	2347	927	2856	2244	1352

Note: Tests administered in the Fall

TABLE 48

CRITERION SCORES OF GRADE ONE PERCEPTUAL FORMS FOR SIX TORONTO AREAS

Perceptual Forms Criterion Scores	Percentage of Students Below Criterion Scores					
	Administrative Area of Toronto					
	1	2	3	4	5	6
0	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%
1	0.1	0.5	0.0	0.6	0.0	0.1
2	0.3	1.4	0.4	0.7	0.2	0.2
3	1.0	2.8	0.7	1.9	0.6	0.4
4	2.1	5.4	1.6	4.1	1.6	1.0
5	4.1	8.5	3.3	7.4	4.1	1.2
6	7.4	14.0	8.0	13.4	8.3	3.8
7	14.1	21.5	14.7	21.9	15.3	7.7
8	23.2	32.0	29.5	32.2	25.1	14.9
9	33.6	44.2	35.2	43.4	37.2	24.5
N	1748	2635	923	2868	2062	1315

Note: All seven figures used in these administrations.

Tests administered in the Fall.

TABLE 49

CRITERION SCORES OF KINDERGARTEN D.A.P. FOR SIX TORONTO AREAS

D.A.P. I.Q. Criterion Scores	Percentage of Students Below Criterion Scores					
	Administrative Area of Toronto					
	1	2	3	4	5	6
55	0.3%	0.5%	1.3%	0.8%	0.0%	0.0%
60	0.8	1.2	1.7	2.3	0.0	0.1
65	2.1	2.2	2.1	4.5	0.9	0.6
70	3.1	4.3	4.4	7.0	1.8	1.9
75	8.1	7.0	8.7	13.4	3.6	3.3
80	13.1	13.5	12.5	24.5	7.6	5.5
85	19.2	13.8	17.1	35.0	14.0	10.1
90	28.1	28.2	27.0	48.0	22.3	15.8
N	385	414	519	515	449	1010

Note: Tests administered in the Spring.

TABLE 50

CRITERION SCORES OF KINDERGARTEN PERCEPTUAL FORMS
FOR SIX TORONTO AREAS

Perceptual Forms Criterion Scores	Percentage of Students Below Criterion Scores					
	Administrative Area of Toronto					
	1	2	3	4	5	6
0	0.7%	0.0%	0.0%	1.8%	0.0%	0.0%
1	0.7	0.6	0.6	7.5	0.9	0.5
2	0.7	1.8	3.3	18.5	1.7	1.2
3	4.7	7.9	7.1	29.5	4.0	2.6
4	12.2	13.1	14.3	33.4	7.6	5.4
5	19.6	26.2	23.0	45.9	15.3	11.0
6	35.8	41.5	33.4	59.1	27.5	18.4
7	53.4	54.9	47.5	68.7	41.1	33.1
N	148	328	335	281	353	646

Note: First five figures (circle, cross, square, triangle, divided rectangle) only; diamonds omitted in these administrations. Tests administered in the Spring.

C

Pupil Description Scale

Teacher-Psychologist Interview

Teacher's Screening Form

BEST COPY AVAILABLE

No______________________________

School No.______

PUPIL DESCRIPTION SCALE

I. Please assign a rating from 1 to 5 on each of the following traits. (A rating of 3 is considered to be average.)

	1	2	3	4	5	
bright	____	____	____	____	____	dull
outgoing	____	____	____	____	____	shy
well co-ordinated	____	____	____	____	____	awkward
independent	____	____	____	____	____	dependent
active	____	____	____	____	____	lethargic
attentive	____	____	____	____	____	inattentive
understands instructions	____	____	____	____	____	has difficulty understanding instructions
speaks well	____	____	____	____	____	immature speech
well behaved	____	____	____	____	____	unruly
sociable	____	____	____	____	____	asocial

II. If this child is selected for further investigation, special consideration should be given to (please check).

A. Behaviour ________

B. Motor skills ________

C. General Intelligence _______

D. Verbal skills _______

E. Physical handicaps _______

MJP.

BEST COPY AVAILABLE

TORONTO EARLY IDENTIFICATION AND DEVELOPMENTAL PROGRAM

TEACHER-PSYCHOLOGIST INTERVIEW

Interview Date: ________

Birthdate: ________

______ Pupil name ______ No. ______ School ______ Teacher ______ Psychologist

01 Vision
-works unusually close to materials
-does not follow teacher's board examples
-eyes wander, turn in, squinting

---

02 Hearing
-does not respond when spoken to
-needs instructions repeated
-speaks too loudly

---

03 Gross Motor
-awkward, falls over own feet, bumps into things
-poor coordination in running, skipping, catching ball
-does not alternate feet on stairs

---

04 Fine motor and eye-hand coordination
-unable to manipulate small objects (scissors,pencils)
-avoids handwork
-pencil work is poorer than most of class; seems immature
-reversals in printing or reading
-shows left-right confusion (hand or progression)

---

05 Activity level
-restless, distractible, overactive
-lethargic, seems tired

---

06 Memory
-can't remember directions
-doesn't remember alphabet, words to songs, days of week, etc.
-forgets things from day to day

---

07 Concept formation
-has difficulty learning concepts such as same-different, large-small
-has difficulty doing puzzles or games
-doesn't understand sequence of time; before-after, early-late
-colour discrimination

---

08 Language
-foreign language
-enunciation
-impoverishment (vocabulary, sentence structure)
-cannot express his ideas

---

09 Attention span
-difficulty in concentrating on one task for longer than a few minutes. Easily distracted by environmental stimuli (visual or auditory).
-daydreaming excessively, blank periods

---

10 Behaviour Characteristics
-shy, withdrawn, rarely speaks spontaneously
-needs constant reassurance, perfectionistic
-excessively attention-seeking
-spoiled, pampered, manipulative
-doesn't respond to discipline
-aggressive, destructive, teasing, lack of self-control
-strange or inappropriate behaviour
-tense, fearful, cries, nervous mannerisms (nail-biting, tics, ...)

---

11 Group Interaction
-dominates, follows
-disruptive
-isolate

---

12 Comments. Note any problems excluded above. Use back of sheet for additional notes.

BEST COPY AVAILABLE

Teacher's Screening Form

Memo to Kindergarten Teachers

Will you please list in the appropriate space the names of any children who obviously fit any of the following descriptive items:

Has been considered for exclusion, or has been previously excluded from school as not ready for group experience.	
Very easily distracted. Attention flits from one thing to another.	
Very restless or overly active. Activity lacks clear direction, form or goal.	
Socially incompetent. Awkward, clumsy and inept in children's games. Last one chosen as partner.	
Easily upset. Marked outbursts of rage, grief, and aggressiveness.	
Unduly disturbed by unexpected sights, sounds and events.	
Poorly organized. "Loses" possessions, "forgets" instructions. Takes an unduly long time to dress and undress.	
Impulsive and meddlesome. Apparently cannot refrain from touching, moving, handling objects.	
Uses little verbal communication in comparison with the other children.	
Avoids, if possible, activities involving cutting, pasting and fine handwork.	
Apparently refuses or is unable to follow directions.	

NOTE: It is anticipated that in your class there will be children who do not fit into any of these categories. One child may be listed in more than one space, if applicable to him. There may be some categories which do not apply to any child.

D

Post-Screening Letters
to Principal

Principal,

Re: Grade One Screening

The Early Identification Program in Grade One at your school has now been completed. In the first level of screening two group tests and three individual tests were administered tapping the areas of gross and fine motor skills, visual and auditory perception and language. The age range of the children assessed was fairly evenly distributed, the ages ranging from 5/5 to 6/10. In general, this particular class exhibited very good skills in gross and fine motor activities. Language and auditory skills were also quite strong. A few children exhibited immaturity in their ability to relate material which had been presented visually, and a number of other children were immature in their knowledge of spatial concepts and in their ability to follow directions on a pencil and paper task. It would appear that this class as a whole would benefit from further experience in relating visual material and in spatial concepts relating to directional tasks.

Certain children were selected for fuller assessments if they obtained low scores on any of the screening tests or if their teacher expressed concern about any aspect of their social, emotional or academic development in the classroom situation. It is interesting to note that among those children selected for further assessment there was a greater proportion of boys than girls than in this particular classroom population. The ages of the children selected ranged from 5/9 to 6/6. Furthermore, among those selected one half were selected because of concerns regarding their classroom behaviour above and beyond concerns for their academic performance. The following children were selected for fuller assessments at this time:

(Names) - selected by teacher - low test scores revealing general immaturity in a number of the areas tapped.

(Names) - selected by low test scores revealing some immaturity in fine motor and visual perception skills. The teacher also indicated concerns regarding the classroom adjustment of the latter two children.

(Names) - selected by teacher because of classroom behaviour and by a low score on one test in the battery.

(Names) - selected because of classroom behaviour although she performed well on all the tests of the screening battery.

(Name) - selected because of a low score on the fine motor test.

(Names) - immaturity in the language area. A full assessment was not done at this time but these children will be followed up later in the school year after they have acquired greater language experience.

Each of these children was seen individually and a detailed analysis of our findings has been written. These reports have been forwarded to the school. The assessments have been discussed with the teacher and individual programs for each child have been undertaken where appropriate. As well, the parents of each child involved in the detailed assessment have been interviewed individually by the psychological services staff member in conjunction with the principal and/or teacher, and the test results regarding their child discussed with them. Three children, (Names) will be seen again within the next six months to reassess their progress.

It is interesting to note that five children transferred into the Grade One from School where they had been involved in the Kindergarten in the previous Spring; (Names). All five children showed change in their development and only one child, (Name), was selected for a fuller assessment.

One child in Grade Two, (Name) , was included in the Grade One screening as he had been transferred into the school in the Fall, and had never been assessed by Student Services. (Name) was selected for further assessment although he performed well on all the tests of initial screening battery, because his teacher felt that he should be exhibiting greater academic performance.

208.

Principal,

Dear

The E.I.D.P. "screening of Grade I children at School has been completed. As you know, the "first level" of the screening process included group drawing tests and brief individual contact with every child. The resulting estimates of each child's intellectual maturity, visual-motor skill, and language development were discussed with their teachers, and together we selected children who needed further assessment. In all, twenty-three children were tested at this "second level", the tests given to each child being dependent upon his particular problem.

A list of children selected is attached, with brief comments about each one. The results of this testing were again discussed with teachers, and some recommendations were made. For some of these children, no further action seems necessary. The progress of others will be followed, and further steps taken if necessary. Several children, however, are in need of complete assessment as soon as possible so that special placement can be arranged if it is required.

I've enjoyed working in School, and have been impressed by the interest and cooperation of the teachers with whom I have worked. Thanks for your hospitality !

Yours sincerely,

Student Services.

Enclosure

ROOM 4

____________________________: Anxious child, doing well academically. Overcoming earlier problem with reversals. If emotional state deteriorates, or interferes with progress, School Social Worker should investigate.

____________________________: Active, distractible. Problem re auditory and visual attention. Poor coordination. Needs motor practice, both gross and fine, and left-right progression exercises. Intelligence apparently average.

____________________________: Very immature. Poor speech. Motor flow and directionality not established. Needs "readiness" activities. Reevaluate in the Fall.

____________________________: Low ability in all areas. Will probably require special program. Has been seen by staff member of psychological services.

____________________________: Poor visual-motor skills. Possible perceptual problem. Verbal abilities developing satisfactorily. Needs practice in left-right progression.

____________________________: Immature, verbal skills better than motor ones. Needs practice in visual matching and in eye-hand coordination. Please refer again if motor control does not improve significantly by next Fall.

ROOM 6

____________________________: Repeating Grade I, withdrawn to Special Program (Primary). Screening data passed to psychological services staff member. Needs hearing tests, speech therapy, special placement.

____________________________: Average ability. Needs practice in language and motor skills.

____________________________: Poor comprehension of language. Special English Class recommended.

ROOM 6 (continued)

____________________________: Very good verbal skills. Poor visual-motor ability. Anxious. Psychological services staff member will assess further.

____________________________: Very poor gross motor control. Intelligence seems average. Daily motor program with Special Program (Primary) recommended and undertaken.

____________________________: Poor language development. Speech correction recommended.

____________________________: Immature, impulsive, rather awkward. Intelligence apparently normal.

ROOM 8

____________________________: Very immature. Poor language development. Some motor difficulty. Teacher feels she is less mature than when she came to school. Question of neurological disorder? Public Health Nurse should be involved.

____________________________: Repeating Grade I. Still rather immature. Left-right progression not established. Many reversals. Poor auditory discrimination. To be assessed further.

____________________________: Good ability. Tense and withdrawn. Often absent. Incipient "school phobia"? Psychological services staff member to check with teacher at regular intervals.

____________________________: Serious language difficulty - reverses order of words, misnames objects, poor auditory discrimination and memory, etc. Check vision and hearing. Assess further (urgent).

____________________________: Anxious, defensive, sometimes aggressive. Intelligence, vocabulary, number concept average. Very poor perceptual-motor integration. Arrange for vision test. Reassess in the Spring.

____________________________: Immature. Relates poorly with peers. Intelligence and visual-motor skills seem satisfactory.

BEST COPY AVAILABLE

ROOM 8 (Continued)

_______________________________: Repeating Grade I. Poor gross and fine motor coordination. Recommended physical education program. Encourage handwork. Check progress in the Spring.

_______________________________: Repeating Grade I. Was assessed last year. Data passed to psychological services staff member.

_______________________________: Serious emotional, intellectual and visual-motor problems. Data passed on to staff member of psychological services, who is carrying case.

_______________________________: Attending Special Program (Primary). Data passed to psychological services staff member for further investigation. Vision check is needed. Consider neurological investigation?

BEST COPY AVAILABLE

E

Teacher's Rating Chart (A)

Teacher's Rating Chart (B)

Test-Retest Reliability of T.R.C. (B)

BEST COPY AVAILABLE

Teacher's Rating Chart (A)

Pupil ....Room No .... School ....

In each category, please circle the number which best expresses your opinion of this pupil.

1. Present level of instruction in Reading.

    1. Readiness material
    2. Chart reading
    3. Pre-primer
    4. Primer
    5. First part of Book I.
    6. Second part of Book I.
    7. Book IIa (first half Gr. II)
    8. Book IIb (last half of Gr. II)
    9. Book IIIa (first half of Gr. III)
    10. Book IIIb (last half of Gr. III)
    11. Book IV (Gr. IV)
    12. Beyond Book IV.

2. Pupil's Reading performance.

    1. Does not recognize words.
    2. Reads with word recognition and comprehension at bottom level of class.
    3. Reads with comprehension and fluency; conveys meaning at middle level of class.
    4. Reads with word recognition and comprehension at top level of class.
    5. Superior reader, able to comprehend most material encountered.

3. Present level of instruction in Mathematics. (Bates, Hill, Roliff series or equivalent)

    1. Preliminary to Book I
    2. First part Book I
    3. Second part Book I
    4. First part Book II
    5. Second part Book II
    6. First part Book III
    7. Second part Book III
    8. First part Book IV
    9. Second part Book IV
    10. Beyond Book IV

4. Pupil's ability to understand mathematical concepts and operations.

    1. Very limited ability to understand mathematical concepts and operations.
    2. Mathematical understanding and problem solving ability is at lower level of class.
    3. Usually able to understand mathematical concepts and operations when presented by teacher.
    4. Mathematical understanding and problem solving ability is at upper level of class.
    5. Superior mathematical ability -- quickly understands mathematical ideas presented by teacher.

5. Pupil's general performance level -- the quality of his work.

    1. Very low performance level. Quality poor.
    2. Has considerable difficulty with work, below average performance.
    3. Performance level is average.
    4. Above average performance.
    5. Work is far above average.
    6. Performance is characterized by extreme variation. Work often ranged from poor to excellent.

6. Does this child have any outstanding unremediated problem at present? (Note that this does not take the place of a referral.)

    1. No outstanding problem

    Yes, problem(s) in:

    2. Vision or hearing
    3. Coordination
    4. Activity level
    5. Memory
    6. Concept formation
    7. Language
    8. Attention span
    10. Group interaction
    11. Achievement
    12. Other (please specify) ______________

Comments may be noted on back of page.

____
Signature.

BEST COPY AVAILABLE

Teacher's Rating Chart (B)

Pupil ....Room No ....School........................

In each category, circle the number which best expresses your own opinion of this pupil.

1. Present level of instruction in Reading.
    1. Readiness material
    2. Chart Reading
    3. Pre-primer
    4. Primer
    5. First Part of Book I
    6. Second part of Book I
    7. Book IIa (first half of Grade II)
    8. Book IIb (last half of Gr. II)
    9. Book IIIa (first half of Gr. III)
    10. Book IIIb (last half of Gr. III)
    11. Book IV (Gr. IV)
    12. Beyond Book IV
2. Pupil's Reading performance.
    1. Does not recognize words.
    2. Reads with word recognition and comprehension at bottom level of class.
    3. Reads with comprehension and fluency; conveys meaning at middle level of class.
    4. Reads with word recognition and comprehension at top level of class.
    5. Superior reader, able to comprehend most material encountered.
3. Pupil's ability to understand mathematical concepts and operations.
    1. Very limited ability to understand mathematical concepts and operations.
    2. Mathematical understanding and problem solving ability is at lower level of class.
    3. Usually able to understand mathematical concepts and operations when presented by teacher.
    4. Mathematical understanding and problem solving ability is at upper level of class.
    5. Superior mathematical ability - quickly understands mathematical ideas presented by teacher.
4. Pupil's general performance level - the quality of his work.
    1. Very low performance level. Quality poor.
    2. Has considerable difficulty with work, below average performance.
    3. Performance level is average.
    4. Above average performance.
    5. Work is far above average.
    6. Performance is characterized by extreme variation. Work often ranges from poor to excellent.
5. Pupil's diligence in performing work.
    1. Seems uninterested in improvement.
    2. Makes an effort to concentrate.
    3. Works at his ability level.
    4. Diligent worker; somewhat above average.
    5. Very diligent; far above average.
    6. Diligence is characterized by variation between very little interest and extreme diligence.

Comments may be noted on back of page.

____
Signature

TABLE 51

TEST-RETEST RELIABILITY OF TEACHER'S RATING CHART (B) ITEMS

Teacher Rating Chart	SCHOOL	
	A	B
	English not first language: 22% Lower socioeconomic group: 11%	English not first language: 13% Lower socioeconomic group 74%
Item	r	r
1. Present Level of Instruction in Reading	.972	.877
2. Pupil's Reading Performance	.816	.856
3. Pupil's ability to understand mathematical concepts and operations	.783	.841
4. Pupil's general performance level- the quality of his work *	.787	.853
5. Pupil's diligence in performing work	.710	.879

* Ratings of "6" were omitted from the statistical analysis

F

Forest Hill Health Form

BEST COPY AVAILABLE

Medical Report for Kindergarten Screening

NAME ____________ SCHOOL ____________ GRADE OR CLASS ____________ TEACHER ____________ DATE ____________

I. PRESENT HEALTH

1. Vision - Normal ________
Wearing glasses - when and where obtained __________
____
Correction with glasses __________
Any recommendations re seating arrangements in classroom -
____

2. Hearing - Normal ________
Describe deviation -

3. Energy - Lethargic ______ Normal ______ Overactive ______
Describe

4. Height - Average ________ Taller ______ Shorter ________
Recent change in growth rate -

5. Weight - Normal ________
Describe deviation -

6. Muscle Tone - Wiry ______ Normal ______ Flaccid ________

7. Motor Skills and Walking Gait
Describe deviation (flat-footed, knock-kneed, etc.)

8. Posture- Erect ________
Describe deviation -

9. General appearance -

10. Other related physical factors - heart condition, allergies, teeth, skin, etc.

II. EARLY DEVELOPMENT

Normal

Describe abnormalities

Past illness - (any hospitalization, any accidents, any after-effects) -

REMARKS: